ARCHIVES OF OPHTHALMOLOGY.

THE VORTEX AND THE NUCLEAR ARCH OF THE HUMAN LENS.

By OTTO BECKER, M.D.,

PROF. OF OPHTHALMOLOGY AT THE UNIVERSITY OF HEIDELBERG.

(*Fig.* 4, *plate ii.*)

Translated by R. O. Born, M.D., New York.

MY researches in regard to the pathological changes of the human lens, which I have carried on for years, convinced me very soon that we do not possess a sufficiently accurate knowledge of the healthy lens. Several questions as to its architecture can only be answered by accurately meridional sections of such fineness that their thickness does not much exceed the breadth of a single fibre.

As, according to Henle, the breadth of the fibres in the peripheral layers, which only interest us at present, is 0.011 *mm.*, the section, in order to be of any value, must not be much thicker than 0.011 *mm.*, and must certainly not exceed twice that thickness. Besides, if we want to trace distinctly the course of an individual fibre, the planes of the section must be perfectly parallel and at the same time be accurately in a meridional direction, since the least deviation would give an oblique section of the adjoining layers of fibres.

Moreover, if we remember the arrangement of the fibres in the human lens, it will be plain that only the young fibres which do not terminate yet in the radii of the star-figure, but which have their insertions at the posterior capsule and the anterior epithelium, can appear entire in

one section, because these fibres only lie in one plane, the other fibres turning in opposite directions as soon as they reach the radii.

As the layer of fibres which have not yet attained their full development is thicker in the lens of the embryo and the newborn than in that of the adult, the former will offer much better opportunities for deciding disputed questions.

By the concurrence of some fortunate circumstances, I am in the possession of such sections, or since, properly speaking, every lens can furnish only one such section of a one-celled entirely meridional section with the adjoining layers. The views which, starting from observations on animals, had for some time also been adopted for the human lens, are by this section precisely defined and finally established. A more detailed description of the specimen, accompanied with a drawing, may therefore not be unwelcome.

The lens, from which this section was taken, came from an eye which had a sagittal diameter of 15.5 *mm.* The child had been prematurely born and had died during birth, and the eye had been transferred to Müller's fluid in such fresh condition that not a trace of the contents of the fibres could be found in the radii of the star-figure, between the lens and posterior capsule and between the lens and the anterior epithelium. The objections of Hensen and Sernoff against the opinions of Bowman, v. Becker, and others, apply therefore also to the human lens. There are also in the human lens no star-shaped fissures with amorphous contents, but the ends of the fibres join directly. The so-called Morgagnian fluid is a post-mortem product. I attach so much importance to this point, because it shows that only the examination of those lenses of animals or of the human eye in which no extravasation of albuminous fluid can be traced, will give any idea of the structure and relation of the fibres as they are during life.

The lens, which in opening the eye had been luxated, was embedded in Calberla's albumen-glycerine mass, as modified by Ruge. When cut with Thoma's large micro-

tome, the consistency of the embedding material and of the lens was so uniform that we succeeded in making a considerable number of sections hardly more than 0.01 *mm.* in thickness through the entire lens. The strictly meridional section and its nearest neighbors show some peripheric fibres to the extent of from 2 to 3 *mm.*

These sections furnish very accurate measurements of the dimensions of the lens. The equatorial diameter of the lens is 5.9 *mm.*, the sagittal 4.24 *mm.;* the radius of curvature of the anterior surface is about 3.75 *mm.*, that of the posterior surface 3.00 *mm.* Since the transition from the anterior to the posterior surface is very obtuse, the form of the entire lens, in spite of the different curvature of the two surfaces, is more spherical than that of the adult. The figure represents a piece 0.75 *mm.* long, and 0.12 *mm.* broad from the equatorial region.

First, our attention is attracted by the varying thickness of the capsule. At the anterior pole, ten measurements give an average of 0.008 *mm.*, somewhat peripherically an average of 0.01 *mm.* In the equatorial region, shortly before the epithelial cells are placed obliquely toward the capsules, the thickness of the capsule is decreased to 0.0059, and opposite the vortex even to 0.0047 *mm.* Further backward, at a place which is still within the insertion of the zonula, the capsule grows thicker pretty rapidly, up to 0.024 *mm.*, and from there becomes gradually thinner, and over the greater portion of the posterior capsule is no thicker than 0.0018 *mm.*

The dimensions of the epithelial cells, and their insertion at the inner surface of the capsule, change with the locality. In the region of the anterior pole they are short hexagonal columns, with a diameter of 0.01 *mm.* at the base, and of the same height. They are, therefore, as broad and thick as the capsule at that place. The almost spherical nucleus of 0.005 *mm.* diameter lies in the centre of the cell. Toward the equator, where the capsule becomes thinner, the cells, whose diameter at the base is slightly increasing, become gradually higher, up to 0.018 *mm.*, the nucleus at the same time occupying the end toward the interior of the lens. At

the equator the cells become rapidly elongated, and are placed more and more obliquely toward the capsule; the outer end, turned backward and upon the section, forms the delicate vortex of the lens, the nuclei, at the same time assuming a more elliptical shape.

In the lenses of older individuals, the thickness of the capsule is considerably increased, the diameter of the cells at the base remains the same, and their height decreases.

The increase in length of the fibres at the vortex of the lens affects, therefore, especially that part of the cells which lies nearest the capsule. From our figure it is evident that the nucleus always retains the same relation to the upper part of the protoplasmatic cell-body, whilst the lower portion becomes elongated, at first vertically toward the capsule, then obliquely, moving backward. At first this portion remains still straight, but later, even before the part in front of the nucleus changes its form, the cells take the shape of an *S*. The last cell, which anteriorly (toward the interior) does not yet show any distinct increase, has, posteriorly from the nucleus, already a more than ninefold elongation. The first cell, which is elongated toward the interior, and which, with this end, covers the two adjoining cells, is posteriorly increased twelve times in length.

The nuclei of the cells at the vortex do not differ in size from the nuclei of the anterior epithelium, but they are more elliptical in shape and are placed vertically to the axis of the lens. Therefore, seen from the surface, the nuclei must appear smaller and nearer together, since the cells become, at the same time, somewhat smaller. But the picture which is produced by this, and which has frequently been misinterpreted, is not nearly so characteristic as that of the bullock. At any rate, our drawing shows that there is no accumulation of so-called formative cells (v. Becker, Kölliker) in the equatorial region.

As soon as the cells of the vortex begin to be elongated also at their anterior end, this elongation takes place much more rapidly than the increase at the posterior end, so that even at the sixth of these cells the nucleus lies in the cen-

tre of the fibre. This more rapid increase at the anterior end continues for some time, until gradually the posterior end increases more, and the nuclei then take their place at about the anterior third of the fibre.

This arrangement causes the nuclei of the nuclear zone to form at first an arch with the convexity backward (v. Becker), which, in our specimen, at the thirty-fifth nucleus passes over into an arch with its convexity forward and about parallel to the anterior capsule. For this double arch, in which the nuclei are arranged in a curved line which has been called nuclear zone, I propose the name of *nuclear arch.*

This nuclear arch, which, in a bullock-embryo of 54 *cm.* in length, for example, is still complete, that is, which meets the arch coming from the other side, does, in our specimen, not reach the anterior pole any more.

The nuclei at the vortex become more and more elliptical, and at the same time increase in size. In specimens which had been hardened in Müller's fluid, the nuclei show with hematoxylin and different anilin colors, at first a bright and uniform staining, no distinct nuclear figure being visible. Farther backward the contents of the nuclei become separated into isolated granules, which, though of bright color, are separated by a transparent substance. These granules become smaller and smaller, and finally disappear altogether.

A large number of these fibres can, in our specimen, be followed throughout their entire length. If it were still necessary to show that each lens-fibre contains only one nucleus, the irrefutable proof would be furnished by our specimen.

Also Henle ("Zur Anatomie der Krystallinse," p. 15) declares that the gradual transition of the epithelial cells into the nuclear lens-fibres is sufficient to take away any doubt of the identity of the epithelial and fibrillar elements of the lens.

Our drawing shows that in the newborn the first and second of those cells, which are elongated also anteriorly, cover two; the third, three; the fourth, six; the fifth, eight; the sixth, nine; and from that every following fibre covers

UofM

about two epithelial cells. This comes partly from the fact that the lens-fibres at the centre have the same breadth as the epithelial cells at their base, namely, 0.01 *mm.*, with a thickness of 0.001 *mm.*, but that they terminate on both sides with considerably broader ends; partly, however, it is also caused by the oblique insertion of the fibres posteriorly.

The vortex and nuclear arch of the human lens vary considerably according to age. The number of those cells which are elongated at the base only, but not yet anteriorly, decreases with age. The oblique position toward the capsule which results therefrom, can in our drawing be followed up to the twenty-fifth cell. In a child four years old I found it in eight only; in a woman of forty-four and fifty-eight years there were about six; at the age of seventy-five only two to three. The first cell passing over the adjoining cells extended in the newborn to the second cell, in a child four years old to the fourth, in a woman of forty-four years to the ninth cell. The portion of the nuclear arch which is convex posteriorly, contains fewer and fewer nuclei; in the newborn there were about thirty, in a woman fifty-eight years old only about ten nuclei. Whereas, in the newborn about seventy fibres are turned outward with their concave side, in a woman of seventy-five the seventh fibre had its convexity outward. In the same manner, the number of those fibres which do not reach the radii of the star-figure decreases with age, but they do not disappear entirely. All these characteristics of the vortex and of the nuclear arch are always present, at least to a certain extent.

MICROPHTHALMOS AND COLOBOMA IN A RABBIT.

By Dr. H. HÖLTZKE,

ASSISTANT SURGEON OF THE OPHTHALMIC CLINIC AT ERLANGEN.

(*With three illustrations, figs.* 1, 2, 3, *plate ii.*)

Translated by R. O. Born, M.D., New York.

THE eye of a rabbit with coloboma of the iris, ciliary body, and choroid and general microphthalmos, was given to me by Prof. Sattler, who also kindly encouraged me to publish the result of the examination.

The eyeball was removed from a full-grown rabbit. Externally we notice in the region of the posterior pole a hemispherical protuberance of the sclerotic, the size of a pea, which above and on the inner side reaches the short stump of the optic nerve. The diameters of the eye compared with those of the other (healthy) eye are: the sagittal diameter, 14.5 *mm.* to 17.5 *mm.*; the equatorial d., 15.0 to 19.0 *mm.*; the diameter of the cornea, 7.0 *mm.* to 15.0 *mm.* in the healthy eye.

The coloboma (plate ii, fig. 1) is downward, and extends through the entire breadth of the iris and ciliary body; the coloboma of the choroid is extended into the upper half of the globe and seems to involve the optic-nerve entrance. Its greatest breadth, immediately behind the equator, is 9.5 *mm.* Anteriorly, behind the region of the ciliary body, there is a small pigmented bridge, *b*, which connects the normal choroid on both sides of the defect.

The retina, which is detached to a great extent on both sides, does not show a distinct defect, except in the prolongation of the defect of the ciliary body, where it forms a sharply defined arch extending almost to the equator. Near the lateral margin of this retinal coloboma passes from the ciliary body backward and inward toward the region of the optic disc a prominent ridge, *l*, which, upon sections, shows two large lumina of blood-vessels. The sclerotic, which in the equatorial region is thinned, becomes excessively thickened toward the posterior pole, with several fissures in its walls, and with an excavation, *s*, on the lateral side of the vascular ridge. The depth of this ectasia does not extend through the entire thickness of the sclerotic, and does not correspond to the protrusion near the optic nerve on the outer surface of the globe. The optic disc cannot be seen.

A series of microscopical sections passing transversely through the coloboma shows (fig. 2) that the thickened posterior wall consists only to a small extent of sclerotic, the latter forming relatively large meshes which on both sides of the pole are filled up with atrophic fatty tissue and large blood-vessels; but at the pole itself, where the excavation was found, it was filled with a peculiar fibrillar tissue, which at once makes the impression of degenerated retina, and which in some places shows elements which resemble Müller's supporting fibres and ganglionic cells. The connection between this degenerated, hyperplastic retina and the surrounding cicatricial tissue is very intimate, and the transition is in many places very gradual. There is nothing which would correspond to the choroid. There is especially no trace of pigment in the excavation. The margins are formed by thickened and slightly prominent ridges of sclerotic.

On both sides of these thickened margins the retina consists of two separate layers, the inner containing the greatly developed basal portion of Müller's fibres and the layer of ganglionic cells, the outer layer consisting of remnants of both layers of granules. Beyond the excavation the ridges meet, and farther forward show upon cross-sections a thick-

ened sclerotic with more or less pigment cells and large lumina of blood-vessels. This part is covered only with a thin vascular membrane of connective tissue, the retina only approaching near to the ridge. We have, therefore, at this place a kind of retinal coloboma.

The choroid shows a different relation near the coloboma. Near the posterior pole the pigment-epithelium and the choroidal stroma suddenly stop, on the inner side, about 5 *mm.* from the ridge; only the suprachoroidal layer being continued a short distance toward the vertical meridian, but not reaching that place where the retina is divided into two lamellæ. On the outer side, the suprachoroidal layer shows the same relation; the other layers of the choroid can be traced to within 2 *mm.* from the outer margin of the staphyloma. Anteriorly the choroid gradually approaches the median line, and at the bridge *b* meets the choroid from the other side. At a level with this bridge appear the first ciliary processes, covered with a continuous layer of dark pigment and the pars ciliaris retinæ.

The free margin of the iris is folded backward, but below the horizontal meridian; the sphincter has again its normal position at the pupillary margin.

Vertical sections through the optic-nerve entrance and the surrounding tissues (fig. 3) show no coloboma of the optic nerve. The central vessels are in the axis of the nerve. The blood-vessels in the lower part of the globe can only be followed to 2 *mm.* from the centre of the disc. The large size of the vessels in the ridge makes it improbable that they were derived from the central vessels of the nerve; besides, there are also cross-sections of other large vessels in the walls of the globe below the disc. The region of the disc and the disc itself are excavated. Below the papilla there are again several deep excavations in the cicatricial sclerotic, lined with degenerated retina. The greater portion of the disc is covered by a fold of retina; the remaining part is hidden by a structureless membrane which lines the entire surface of the retina. This membrane, probably the thickened inner limiting layer of the retina, reaches in some places the thickness of Descemet's membrane, and has on its inner sur-

face a net-work of capillaries and larger blood-vessels. In all the other parts of the eye also, the retina shows interstitial proliferation and atrophy of the nervous elements; in the upper half, especially, we find in some places dense connective tissue, pigmented in the outer layers, forming slight elevations which are covered by the other layers of the retina. In some places the pigment-epithelium is defective underneath these proliferations (fig. 3, *h*).

The explanation of the above-described changes is very simple. There have evidently been extensive inflammatory processes in the eye, and I see no reason why we should not adopt Deutschmann's view (*Klin. Monatsbl. f. Augenh.*, March, 1881), that the arrest of development is only a changed development of the eye in consequence of an intrauterine inflammation. This inflammation has probably taken place in the latter half of the third week; the fœtal fissure was nearly closed, or after having been closed, was again opened; the iris, on the other hand, had not begun to develop. Why this inflammation was just at this fissure, which is so important for the development of the eye, cannot be decided, unless it was favored by the greater vascularity of this neighborhood.

SYNCHYSIS SCINTILLANS.

By DAVID WEBSTER, M.D.,
PROFESSOR OF OPHTHALMOLOGY IN THE NEW YORK POLICLINIC.

THAT affection of the vitreous humor known as scintillating or sparkling synchysis, is, in New York, a comparatively rare disease. At the Brooklyn Eye and Ear Hospital only *two cases* were seen among the twenty-eight thousand eight hundred and sixteen (28,816) patients with diseases of the eye treated at that institution in the first fourteen years of its existence. At the Manhattan Eye and Ear Hospital, New York, *three cases* were found among the twenty-six thousand seven hundred and fifty-six (26,756) eye-patients registered there during its first thirteen years of work. Thus out of a total of 45,572 patients with diseases of the eye only five were found with crystals of cholesterine in the vitreous humor.

In India, according to Mr. Macnamara, formerly of Calcutta, now of London, the affection is much more frequently met with. He says: "Among the natives of India these appearances are sometimes seen in consequence of the lens having been thrust down into the vitreous in the operation of depression or reclination for the cure of cataract. We not unfrequently have patients applying for relief at the Ophthalmic Hospital under these circumstances, suffering from atrophy of the retina and choroid, together with sparkling synchysis." ("Diseases of the Eye," 1882, p, 397.)

The disease is well known to be due to degenerative changes occurring in the vitreous humor, though the causes of those changes, when not traumatic, are not always apparent.

The prognosis, when the disease is of traumatic origin, or accompanied by changes in the crystalline lens, optic nerve, retina, or choroid, is of course decidedly unfavorable. When of idiopathic origin and complicated the reverse seems to be the case. In the first case herewith reported, the patient is still actively engaged in work requiring the close use of his eyes, although seventy years of age, and although ten years have elapsed since he was known to have sparkling synchysis of both eyes. Of the subsequent histories of the other three cases I know nothing.

In regard to the management of these cases, no local treatment seems to be indicated. But in common with all chronic eye-affections I have no doubt that they may be benefited by attention to the general health. Of course the kidneys, the heart, and other important organs should be carefully investigated, and may furnish indications for general treatment.

The following four cases are extracted from the private case-books of Dr. C. R. Agnew, of New York, and are all of idiopathic origin, unless we except the third, as having been caused by concussion, the patient having been thrown from a horse twenty-three years before we saw her. If the disease of the vitreous was produced by the fall, we may learn from this case how long it may exist without producing any considerable impairment of vision.

The fact that an eye with a fluid vitreous which has undergone chemical changes resulting in the formation of numerous crystals of cholesterine may still retain vision $\frac{20}{20}$, seems to me a very remarkable one: yet in two of these cases the patient could read $\frac{20}{20}$ after waiting a few moments for the sediment to settle down out of the axis of vision; in a third the vision was $\frac{20}{30}$; and only in the fourth, where there were lenticular complications, was the sight very materially impaired.

Those who wish to study this disease more particularly are referred to:

1. Chambé: Contribution à l' étude du synchisis étincelant, 40 pages, avec une planche. *Thèse de Paris*, 1876.
2. Poncet: "Histologie du synchisis étincelant."

3. Van den Bossche, E.: Observation de synchisis étincelant. *Presse méd belge*, No. 32;
as well as to the text-books, in common use, on the eye.

CASE 1.—March 21, 1873. Mr. T., statesman, aged sixty, has had more or less pain on using his eyes for reading and writing, for a long time. About three weeks ago he was attacked, rather suddenly, with a mistiness of vision of both eyes. This haziness of sight has since remained about the same, and the pain in his eyes, has been more annoying than previously. He considers his general health fair for a man of his age. He smokes cigars excesssively and indulges freely in snuff. Each eye has vision $\frac{20}{20}$, and both are emmetropic. He reads Jaeger No. 1 with his glasses.

Ophthalmoscopic examination reveals the presence of numerous crystals of cholesterine in the vitreous humor. On causing him to move his eye about rapidly and then to suddenly fix it, beautiful showers of sparkling crystals are seen slowly falling, and flitting past each other in various directions, through the vitreous, and thus gradually settling down into the bottom of the vitreous chamber. The crystals having settled, the fundus can be seen to be normal.

CASE 2.—April 4, 1876. Mr. M., aged fifty-two, a teacher in the public schools, says that his eyes have troubled him only within a few months. He has never used glasses for reading, and can still read Jaeger No. 1, with much apparent effort, at a distance of thirteen inches. Vision $= \frac{20}{30}$, each eye, and no improvement with glasses. Reads more comfortably with $+\frac{1}{40}$. No insufficiency of ocular muscles.

Ophthalmoscopic examination shows sparkling synchysis of the left eye.

CASE 3.—June 29, 1876. Miss A. C. C., aged forty, when seventeen years of age fell from a horse, and "injured her spine sympathetically." She was a patient of Dr. J. Marion Sims, and was confined to a sofa most of the time for twelve years. Her eyes have been weak ever since the injury. They suffer from a sense of heat after being used, in reading or sewing, for a short time, and from aching, darting pains. There is an hereditary tendency to weak eyes in the family. Each eye has vision $= \frac{20}{30}$, and Hm. $\frac{1}{7}$. Insufficiency of interni 6° at 1′ and 2° at 20′. Presbyopia $\frac{1}{28}$.

Ophthalmoscopic examination shows numerous crystals of cholesterine in the left vitreous humor, not settling to the bottom, but apparently attached to a web-like structure, so as to make only slight excursions on moving and then fixing the eye. Some of the crystals seem to be embedded in the retina. Three or four are situated in the vitreous almost in contact with the optic disc. There is physiological excavation of both optic discs, with visible pulsation of the retinal veins.

CASE 4.—Sept. 16, 1878. Mrs. C. McD., aged seventy-six, one year ago first noticed impairment of vision, and for the last six months has not been able to read a word. She has a patch of xanthelasma at each inner canthus.

Right eye, vision = $\frac{3}{200}$.

Left eye, vision = $\frac{20}{200}$.

Ophthalmoscopic examination shows lenticular opacities in both eyes. In the right eye the whole vitreous seems to be studded with small, round, white dots, with a few glittering crystals scattered about among them.

CYSTIC TUMOR OF THE ORBIT REMOVED BY ELECTROLYSIS; RESTORATION OF VISION.

By J. L. THOMPSON, Indianapolis, Indiana.

(*With two wood-cuts.*)

McNaughton, John, a bright little fellow of five years, was first brought to me on Oct. 7, 1882, for treatment. The left eye protruded, was turned outward and downward, and a growth was plainly to be seen above the *tendo oculi* and behind the upper eyelid. The eye could be readily turned outward and downward, but was very much limited in its action in the opposite directions. The pupil responded readily to light; and V= $\frac{2}{L}$ in the affected, and $\frac{2}{XX}$ in the sound, eye. He did not complain of diplopia, nor could I, in any way, with or without prisms, cause the duplication of images; but he had already learned to hold his head to one side. With the ophthalmoscope, the fundus was seen to be normal, with refraction slightly hypermetropic. His father informed me that the family had only noticed that there was any thing the matter with the eye for a few weeks, and then only on account of a slight irritation and occasional redness of the eye, for which they used an eye-water. They then consulted their physician, who sent him to me for further examination. On digital exploration I was convinced that the growth was of a cystic character, and situated far back in the orbit, and that it had existed much longer than they had supposed, from the fact of his having already learned to mentally suppress the image of the affected eye. In accordance with the above view, I wrote to their physician, requesting him to watch the case and to let me see it again in a few weeks, or sooner, if any change took place. In about two weeks the boy was again brought to me with the parts looking almost as when first seen, and again was he sent

home with the same request to their physician as before. On the third visit the parents seemed very anxious about their child, when I plainly informed them of the gravity of the case, telling them that in all human probability the eye would eventually have to be sacrificed before the tumor could be completely removed; that we would first attempt a cure short of the destruction of the globe, but that they might prepare for the worst. As it was my intention to first try the effects of electrolysis, a photograph of the boy was procured in order that we might see what headway we were making after each application. The accompanying wood-cut is as near like the photograph as it is possible to make one.

FIG. 1.

In the interval of the child's visits to me, he was, unknown to myself, taken to my dear friend and teacher, Dr. E. Williams, of Cincinnati, who, as I am informed by the parents, and have since learned from the doctor himself, feared it was a malignant growth; but he saw it only the one time, and was not informed that the case was under my care. Indeed, I never knew that any oculist had been consulted until four months after the operation had been made.

On the 14th of November, 1882, he was etherized, when a small exploring trochar (with canula) was thrust nearly two

inches into the growth, and upon its withdrawal, about three drachms of dark-looking fluid followed. As soon as this ceased to flow through the canula, the latter was connected with the positive pole of a Stöhrer's galvanic battery with twenty cells in action, and the current was closed with a covered moistened negative electrode on the corresponding temple. The closing of the current caused him to struggle very much, and it was opened until more ether was administered, when it was again closed, continued for five minutes and then discontinued. The withdrawal of the silver canula was very difficult, owing to its adhesion to the tissues, and it was found to have been nearly eaten through in several places. Considerable oozing of fluid took place after the operation was completed.

In three hours after the operation he was taken home (twenty miles) and placed under the care of his physician, who, for several days used iced applications continuously. Very great reaction followed, with inflammation and much swelling of the eyelid, but on December 13th, just one month from the time of operating, Dr. Payne (his physician) wrote me as follows:

"DEAR DOCTOR:—The eye has resumed *nearly* its normal position. Motion is perfect, and only a trifle of vascularity remains in the lids. It looks as if restoration to the normal condition was almost complete."

I have seen the case twice since, and find the eye to be perfectly straight, with $V = \frac{20}{XXX}$, and motion complete in every direction. The accompanying wood-cut is from a photograph taken April 17, 1883, and is a true picture of his present condition.

The above case brings up several questions concerning the application of the galvanic current, which I would very much like to see answered by the more able of the contributors to these ARCHIVES, who have had more experience with the remedy than myself. Indeed, I have never read of the cure of a similar tumor of the orbit by this method (though many may have been published). Often have I read of, and occasionally have I seen, tumors of other parts of the body cured by electrolysis, but in these cases needles could be passed into both ends of the tumor; while in my case but one electrode could be applied to the growth. Doubtless, with myself, many who read this will ask: Were too many cells of the battery used in this case? Some would give the successful result as an answer; and yet one might

use the same treatment in another, apparently similar case, and such an inflammation of the cellular tissue of the orbit might follow as to entirely destroy vision, or cause an unsightly appearance of the eyeball.

FIG. 2.

Again: Was it by electrolysis? or was it by the inflammatory action caused by the heating effects of the current upon the canula that cured the case? or, was it by both of these combined? These are points which one learns but little about in the many text-books one meets with on electricity, and yet they are the very ones concerning which we wish to know more. I therefore consider that every such case, treated as was the above, should be published, as it adds to the gradually accumulating experience of our profession, and thereby slightly aids in its development into, if not a science, at least an educated empiricism, the judicious practice of which, conduces very much to the happiness of our patients.

A CASE OF PULSATING EXOPHTHALMUS; LIGATION OF THE LEFT COMMON CAROTID; DEATH.

By DAVID COGGIN, M.D., Salem, Mass.

Mrs. L., aged sixty-six, born in Ireland, presented herself at the Salem Hospital, Sept. 22, 1876, having a catarrhal conjunctivitis.

Three years later she returned with an acute inflammation of the left lachrymal sac.

Feb. 15, 1882, she appeared again because of noise in the left ear, which was annoying, especially at night. A chronic catarrh of both middle ears being present, it was supposed to account for the tinnitus. Catheterization was tried, and the potassium bromide with ergot was given. Patient of a full habit with the capillaries of face and conjunctiva dilated from beer-drinking. Health good, ordinarily. No blow or other accident had been met with.

Treatment followed, with some variations, till April 19th, with no relief from the noises. At this time complaint was made of loss of sight—left eye. Incipient cataract; no change in fundus observed; occasional pain in left eye and brow.

Slight convergence of left eye noticed with some protrusion, which was easily reduced. No impulse felt. May 8th, pulsation of eyeball now visible and recognized by palpation—it being more marked on pressing the globe back into the orbit. On separating the lids the eye protruded noticeably. External rectus paralyzed.

On applying a stethoscope on the eye, a loud bruit was heard, and also, in a less degree, when the instrument was placed on different regions of the head; but it ceased on pressing the common

carotid, and the patient exclaimed: "The noise in my head has stopped entirely." Heart sounds normal. (At this time there was no sphygmograph in the hospital.)

May 18th. Entered the hospital. Pressure-band on eye. Tinct. verat. vir., gradually increased till five minims were taken every hour, the pulse not going below sixty-five. Some relief was evidently afforded, as, on suspending it for twelve hours, the patient begged for it again, the distress in her head had so increased. Digital pressure on the carotid was attempted, at intervals, for two days, but was not tolerated longer than seven minutes; neither was a tourniquet.

May 25th. By the advice of Dr. Wm. Mack, ether was administered to the patient and the tourniquet was applied and continued for fifteen minutes, when the slow and labored respiration and flushed face caused me to remove it.

June 1st. A consultation having been held with the other members of the staff, ligation of the common carotid was suggested and its risks explained to the patient. She consented to the operation, saying she could not live unless relieved of the noise in her head, which had become tormenting.

An examination of her urine the previous day had resulted in finding a few granular casts, after several trials. Under ether, Dr. Arthur Kemble ligated the artery at its upper part, and no bruit could afterward be detected with the stethoscope, while the eye receded somewhat. On recovering consciousness from the ether, the patient was rational, though she insisted she still heard a noise in her head. This may have been imaginary, or it may have been real, from the propagation of the wave from the basilary, but too feeble to be made out by the stethoscope.

June 2d. Mind wanders, but can be aroused, and counts fingers with left eye. Exophthalmus and congestion of conjunctiva less. Pulse 96, temperature 101.2° F.

Redness, pain, and swelling below wound in neck.

June 3d. State of stupor. Protrudes tongue on being asked. Shrinks and moans on touching wound. Pulse 100, temperature 101.5°.

June 4th. During the night, hemiplegia of the right side appeared. Tongue deviates to the *left.* Drinks readily. Pulse 115, temperature 101.5°.

June 5th. Pupils dilated. Face puffy. Respiration 50, pulse 150, temperature 103°. Died.

An autopsy was held on the same day.

Permission was obtained so late that, with the undertaker and the relatives of the deceased impatiently waiting in the adjoining room, the examination was, if not superficial, far from satisfactory.

There were found old pleuritic adhesions on the right side. Heart soft and collapsed as if fatty.

Two calculi in gall bladder ; kidneys small. Temporal, parietal, and occipital lobes of left hemisphere of brain much softened and friable. Venous sinuses normal, so far as seen.

After removing the roof, the contents of the left orbit were taken out, together with the eye.

Ophthalmic vein perhaps larger than usual. No aneurism of the ophthalmic artery (and there is no well-authenticated case of one on record).

Cause of bruit and pulsation not discovered. A part of the sphenoid and temporal bones was removed *en masse*. Some days later this was examined, when, on exposing the carotid artery, throughout its course in the canal, a marked aneurismal dilatation of the cavernous portion was revealed, which proved to be due to fatty degeneration.

A REVIEW OF THE THEORIES OF HEMERALOPIA, WITH A CASE OF NIGHT-BLINDNESS FROM MIASMATIC INFLUENCES, AFFECTING FOUR CHILDREN OF THE SAME FAMILY.

By CHARLES ZIMMERMANN, M.D.,
ASSISTANT SURGEON TO MARYLAND EYE AND EAR INSTITUTE, BALTIMORE, MD.

IN the beginning of last year Dr. Geo. Reuling, surgeon of the above institution, observed a small epidemic of hemeralopia (nyctamblyopia), evidently caused by miasmatic influences. As in regard to this kind of etiology the opinions of authors differ considerably, the publication of this observation may be of sufficient interest. On this occasion the present writer went over the literature of hemeralopia, and thought that a review of the different theories advanced in regard to this disease, especially its etiology, might not be unwelcome to the readers of these ARCHIVES.

The expression hemeralopia was not used until recently, though night-blindness itself was known even to the ancients. In the period before Alexander, night-blindness with other disturbances of sight, especially photophobia, were reckoned among nyctalopia. Celsus, agreeing with the Hippocratic physicians, meant by this latter term night-blindness, whereas Galenus used it in an opposite sense. The Egyptians (according to Pliny) knew both diseases. The Arabs followed Galenus. In the eighteenth century there was a difference between nyctalopia and hemeralopia, but this difference in regard to the confounded etymology of both words was often confused. Hemeralopia was considered a

form which we now would call "asthenopic amblyopia," and nyctalopia was considered a consequence of a state of irritation of the retina. In the nineteenth century hemeralopia was regarded as torpor of the retina caused by abnormal meteorological influences, as well as extremely bright light or congenital deficiency. In the second half of our century the expression was more clearly defined and divided according to its etiology, course, and objective conditions. Netter (Lettres sur l' héméralopie et l' affection dite rétinite pigmentaire. *Annal. d'ocul.* t. 75, p. 198), for instance, distinguishes between congenital and acquired hemeralopia. The congenital again is divided into a mild and a serious form, which accordingly were named idiopathic hemeralopia and retinitis pigmentosa. Both are only different degrees of the same disease. The hereditary form may be considered as resembling the congenital, described by Pagenstecher (*C.f. A.*, August supplement, p. xi, und Berichte der 11; Heidelberger Versammlung, p. 149). This author found hemeralopia hereditary in a family for many decades affecting only its male members after passing one generation over.

The acquired night-blindness is observed in two forms, the symptomatic and the idiopathic one. In the latter are included all cases in which there are no certain ophthalmoscopical alterations, and for which no certain causes can be found. Therefore, the epidemic form was placed in this category. The symptomatic night-blindness, however, seems to be the most common as a symptom (1) of a certain eye-disease, or (2) of a general affection of the body. By this division the different descriptions of the ophthalmoscopic conditions in hemeralopia are explained. If hemeralopia is joined with other diseases of the eye the ophthalmoscopic changes of these diseases will be found, and in those cases hemeralopia will be a functional disturbance only. No alteration of the fundus is found, when night-blindness is idiopathic or when caused by general diseases of the body. In congenital hemeralopia, the same condition is generally observed, although in some cases degeneration of the retina will be found. The special eye-diseases with which hemeralopia sometimes is connected are the following:

1. Affections of the conjunctiva which may give rise to its development. Snell (On a peculiar appearance of the conjunctiva in some cases of night-blindness. *Lancet*, Jan. 1, p. 8) found whitish-gray patches in the conjunctiva of the eyeball on both sides of the cornea or only on the outer margin. These patches consisted of little blisters which followed the movements of the conjunctiva, disappearing by pressure but returning after some hours. The epithelial layer was not thickened. This affection appeared and disappeared together with the hemeralopia. The fundus of the eye was normal, and in some cases the vessels appeared slightly blurred. Only children were attacked, and especially those of a healthy constitution. The cause could not be found out. Snell never saw a case of hemeralopia without this conjunctival affection. According to Saemisch (*Handbuch der Angenheilkunde*, Bd. iv, p. 133), hemeralopia and xerosis conjunctivæ are undoubtedly connected, although an exact explanation of this connection cannot be given. The same is observed by Bitot (Mémoire sur une lésion conjunctivale non encore décrite coincidante avec l' héméralopie. *Gaz. méd.*, 1863, p. 435) in twenty-nine cases. Villemin (*Gaz. méd.*, 1863, May 21) explains this connection in the following way: The remainder of the epithelial scales covering the cornea obscure its transparency so that twilight and artificially diminished illumination cannot penetrate. Netter (*Gaz. méd.*, 1863, p. 505. Mémoires sur les taches blanches des sclérotiques dans l' héméralopie) does not agree with this, but he thinks that the epithelial scales are caused by the bright light of the sun, and this of itself causes hemeralopia. A similar observation is made by Adler (*Klin. Monatsbl. für Augenheilkunde*, p. 91). Among a hundred deaf children in an asylum twenty-three suffered from idiopathic hemeralopia; twenty of these had conjunctival ophthalmia and triangular xerotic patches on the conjunctiva bulbi close to the periphery of the cornea (Bitot's spots). These patches were dry and glittering like silver, and gently rising over the surface of the conjunctiva. The laceration of the fatty-degenerated epithelial layer resembled fish-scales. Thirteen suffered

from xerophthalmia without hemeralopia. Adler thinks that in these cases hemeralopia and xerosis were caused by the bright light to which the pupils had been exposed. By others, for instance Weiss (*Berliner klinische Wochenschrift*, 1873, pp. 232–234), an affection of the conjunctiva is regarded as an appearance belonging to hemeralopia. In slight cases of this affection the conjunctiva of the lids appears only somewhat injected; in more serious ones the eyeball participates. Afterward, a triangular-shaped piece of the conjunctiva becomes glittering like mother-of-pearl, generally on the external margin but sometimes on the inner part of the cornea. The base of this triangle is turned toward the cornea, the apex toward the canthus. In a later stage the patches above mentioned change their appearance in such a way that they resemble chalk. Weiss found on microscopical examination that these particles, which were caused by the rubbing of the lids against each other, consisted of detritus. In regard to these different opinions about the affections of the conjunctiva in cases of hemeralopia, it is considered partly as a complication, partly as an affection constantly found whenever hemeralopia is observed. It seems that in cases in which the disease of the conjunctiva does not reach the cornea, the supposition of a connection between the two diseases is not probable, whereas the opinion of Villemin above mentioned is very likely correct.

2. According to Foerster (*Graefe's Archiv*, Bd. xx, p. 41), in choroiditis syphilitica the most constant symptom is the insensibility of the retina, viz., hemeralopia. In Graefe-Saemisch's hand-book (Bd. iv, p. 629), the same is mentioned in cases of chorio-retinitis specifica. Schoeler (*Deutsche Klinik*, 1874, pp. 11–13) communicates a case of a very rapid development of myopia in acute sclerotico-chorioiditis, of which the most striking and first symptom was night-blindness. In the outer side of the optic disc, with which is connected a very pale circular zone, about one and a half or two centimetres in diameter, there are slightly developed glittering crescents of the sclera. The circumference of the optic disc is sharp, the color does not differ

much from the white of the neighboring choroid. After one year, myopia had increased with progressive atrophy of the choroid, hemeralopia continuing. Fitzgerald (*Irish Hosp. Gaz.*, Jan. 15, 1873) describes congenital hemeralopia in cases of myopia ($\frac{1}{8}$ V = 1) without any ophthalmoscopic alteration. Staphyloma posticum (myopia $\frac{1}{8}$ V. r. $\frac{20}{70}$, V. l. $\frac{20}{100}$), with congenital hemeralopia, was found by Leber (Graefe-Saemisch's hand-book). On the left side of the yellow spot, discoloration of the pigment, with some irregular patches, was observed. The choroidal vessels could be seen everywhere on a dark ground.

Koenig communicates, in his dissertation, two cases of imperfect development of the choroid, in which hemeralopia was the chief functional symptom. Upon examination with the ophthalmoscope, the capillary layer of the choroid could only be discovered at the yellow spot, which looked red. The whole remaining fundus was seen as a white surface, interrupted by a few pigmented patches. Over these the retinal vessels took their course, and only a few larger choroidal vessels emerged there. The optic disc itself was bright red and sharply defined.

3. In diseases of the retina hemeralopia is found, especially in retinitis pigmentosa. According to von Graefe (*Graefe's Archiv*, Bd. iv, p. 250), hemeralopia constitutes, in fact, its characteristic symptom. It makes its appearance in the very first stage, together with concentric contraction of the field of vision. In most cases of congenital night-blindness this retinal disease is likewise met with. A deposit of pigment, however, never takes place very soon after birth (Leber, in Graefe-Saemisch's hand-book, v, p. 648). The hemeralopia is caused by congenital atrophy of the retina, to which, in a later stage, pigmentation is added. Leber thinks that the ophthalmoscopic examination is not sufficient for determining exactly whether there may not be some masses of pigment strewn about the retina in such a slight degree that they cannot be noticed.

This is proved by Poncet (*Annal. d' ocul.*, 24, pp. 234–239). A man twenty-one years of age, suffering from congenital hemeralopia, died of scarlet-fever. The anatomical exami-

nation of the eye was made, and there was found a deposit of pigment in the deeper layers of the retina, especially the external granular layer. This could not have been proved before with the ophthalmoscope.

Perhaps all cases described as "retinitis sine pigmento" might show the same condition by examination with the microscope.

Guaita (*Annali di ottalm.*, iv, pp. 135–139, observations made in Quaglino's hospital) saw hemeralopia after previous neuro-retinitis, and considered it as a congenital form. In the retina no deposit of pigment could be discovered. The optic nerve was pale, the arteries of the retina small. The pigment of the choroid and retina was rarefied, especially near the equator. The characteristic ophthalmoscopic conditions in epidemic hemeralopia are described by Netter (*l. c.*), according to the examinations of Quaglino, Martialis, Poncet, and Galezowski, in the following way: Contraction of the peripapillar arteries, enlargement of the peripapillar veins, and circumscribed œdema of the retina. The optic disc, as the centre of the retinal circulation, is encircled at its periphery by pigment. The girdle of pigment thus formed may vary in its thickness according to the influence of light—and consequently the circulation of blood in the retina is regulated by the quantity of light falling upon it. The retinal vessels become smaller with the diminution of the pupil and larger with its dilatation. Continued illumination of the eye with a coal-oil lamp produces diminution of the size of the vessels and œdema (Mormoyer). He thinks the epidemical hemeralopia is caused by the stimulating light of the sun, which produces deposits of pigment similar to those on the skin; the symptoms just mentioned make their appearance under the influence of the sunlight. Retinitis pigmentosa would arise undoubtedly from the continued maceration of pigment deposited around the optic disc and effected by the œdema. Thus, by diffusion pigment-particles are diffused to other parts of the retina and set up circumscribed inflammation, which finally leads to adhesions between choroid and retina and to infiltration of the latter with pigment.

Schweigger also ("Vorlesungen über den Augenspiegel," p. 113) has noticed the presence of hemeralopia and contraction of the field of vision in children before the appearance of any pigment in the retina. But in all these cases there was a marked contraction of the retinal arteries, whilst the elder children of the same family had retinitis pigmentosa. He also observed in older persons hemeralopia and contraction of the visual field without any trace of pigmentation of the retina or any other symptom—except contraction of the arteries and paleness of the disc. Therefore, he thinks that this torpor of the retina is in all probability not due to the pigmentation of the retina, but to the obliteration of the vessels or of their calibre through hypertrophy of their coats, so that the retina obtains a diminished and insufficient supply of blood. Poncet (Épidémie d' héméralopie, *Gaz. des hôp.*, 1869, 29) gives the following description of the ophthalmoscopical condition as a completely characteristic one: Anæmia of the arteries of the retina, which become extremely contracted and pale, and show double coutours close to the disc. The veins are dark and swollen. The disc is often red and slightly engorged. Œdema of the disc and the retina (which is observed by Italian physicians), though frequently met with, is not pathognomonic. It makes its appearance either along the anæmic vessels or on the margin of the disc.

In all these eye-diseases just mentioned, of which night-blindness is observed as a symptom, retinitis pigmentosa seems to be the only one with which hemeralopia is constantly connected. The observations about all the other affections are, on the one side, not numerous enough to give sufficient evidence; on the other side, they contemplate hemeralopia as a consequence of those diseases, whereas it appears more probably independent of them, produced only by the same influences. These influences are found in a simpler manner in general diseases and disturbances of nutrition. In those cases the fundus of the eye does not show any peculiar changes.

1. The most frequent of these diseases were those of the liver. According to Fumagalli (Sulla patogenesi dell' em-

eralopia essenziale. *Annali di ottalm.*, ii, pp. 271–494), hemeralopia consists in affections of the liver. He found in patients suffering from night-blindness, signs of icterus. The retina had a grayish reflex and was œdematous. The arteries were narrow, the veins swollen, the epithelial pigment was darker than usual. He gives the following explanation:

Cholæmia, caused by the affection of the liver, diminishes the nourishment of the tissues, retards the circulation of blood, thus producing arterial ischæmia, venous stasis, and serous exudation. The coloring matter of the bile circulating in the blood, is deposited in the epithelial pigment layer of the retina. On account of the interrupted nutrition of the cones and rods, a very bright light is necessary to be perceived by the retina. Perinaud (De l' héméralopie dans les affections du foie et de la nature de la cécité nocturne. *Arch. génér. de méd.*, April, 1881) says that hemeralopia is not rare in diseases of the liver, especially in chronic forms—for example, in cirrhosis. The cause must be sought, not in the coëxistent icterus, but in the alteration of the blood, the result of the affection of the liver and the functional disturbance produced by it. By Koten (*Recueil d' ophth.*, p. 185, 1879) hemeralopia was observed, together with xanthopsia, in general icterus, which occurred three months after an abortion. Xanthopsia diminished suddenly, hemeralopia persisting.

Litten (*Zeitschrift f. klin. Medicin*) found in two cases of cirrhosis hepatis pigment degeneration of the retina. In nine cases of various affections of the liver he detected hemeralopia without any evident retinal change.

2. Affections of the kidneys sometimes produce hemeralopia. A man confined to bed for months on account of diffuse nephritis, albuminuria, dropsy, became hemeralopic without being exposed to bright light. Therefore, Förster (who observed this case) concludes that certain anomalies of nourishment and blood are necessary conditions for the origin of night-blindness. In a similar way, hemeralopia, with women in the last weeks of pregnancy, is produced, according to Litzmann, by an affection of the kidneys corresponding to retinitis albuminurica and uræmic amaurosis.

3. Hemeralopia has been seen in children after irritation by helminthiasis; and, furthermore, in children whose parents were blood-relations.

4. Authors generally agree that malnutrition is most prominently the cause of epidemic hemeralopia, inasmuch as in all cases insufficiency of food-supply or impoverished condition of the blood was observed. Even in cases without any exposure to bright light, as, for instance, among the sailors of an Arctic expedition during the long winter night, hemeralopia has occurred (Weiss: *Berliner klinische Wochenschrift*, p. 232). The epidemics of hemeralopia among the garrison of Strassburg began almost regularly in March, and disappeared in April, in which months the sun has no great power. We not unfrequently find hemeralopia existing among people on long sea-voyages. This is not so much the consequence of exposure to the tropical sun as more probably the scarcity of proper food and the malnutrition following it. Many of them were suffering from scurvy (Soelberg-Wells: "Treatise on the Diseases of the Eye"). In epidemics among the army, only the soldiers are attacked, not the officers and sub-officers, who enjoy a more generous diet. In Brazil mostly the slaves are disposed to this disease. In Germany and France it sometimes breaks out epidemically in prisons, schools, military camps, etc. In England and Scotland, where even the lower classes enjoy a more generous meat diet, the disease has never been observed epidemically. (Falk: *Schmidt's Jahrbücher*, 159, p. 290). In the cloisters of Poland, epidemic hemeralopia often occurs in the days of fasting before Easter (Fritsch: Note sur l' hémér-alopie. *Lyon médical*, p. 565). The same is observed by Grosoli (*Annali di ottalm.*, ii, p. 24), in a college of nineteen boys near Modena. There, for three successive years, hemeralopia broke out epidemically in the days of fasting. Bunke (*Virchow's Archiv*, 52, p. 570) observed an epidemic of night-blindness among the French captives in Lingen. He thinks the cause to be the over-stimulation of the retina by extremely bright light. But it seems that the crowding together in barracks was the reason of the epidemic.

Another proof for the theory of malnutrition as the cause of this affection is found in the beneficial effect of a tonifying treatment. Under the administration of tonics like quinine, iron, cod-liver oil, strychnia, galvanism, and the enjoyment of a generous diet, epidemical night-blindness generally disappeared rapidly. The connection between nystagmus, frequently observed in miners, and hemeralopia (Nieden: *Berl. klin. Wochenschrift*, No. 47), seems to have its origin in the fact that hemeralopia produces the nystagmus. Hemeralopia occurs often in miners, on account of their occupation in the confined and vitiated atmosphere of mines. Since hemeralopia is generally accompanied by a considerable contraction of the field of vision, patients affected by this condition have to move their eyes constantly in order to gain the largest possible field of vision. This very often leads to real oscillations of the bulb (nystagmus).

Miasmatic influences are, however, not mentioned as important causes of hemeralopia, or, if they are spoken of, their agency is denied (Falk, Leber). Our case furnishes, as I think, a convincing and striking instance for this kind of etiology, which seems as important and is perhaps more frequent than hitherto supposed.

Our case was observed in a family consisting of the parents and four children, who previously were all healthy. After leaving their residence and taking a house in a low situation and close to a sewer, the father suddenly fell ill from typhoid fever, and the children were attacked by intermittent fever together with hemeralopia. On examination with the ophthalmoscope no alteration of the fundus could be found. No other cause could be pointed out than the influence of the malarial emanation. The fever disappeared after administration of quinine, the night-blindness persisted despite treatment with iron and other tonics. It was only after the family had left this house and taken another one in a higher situation, in a very healthy quarter of the city, that a rapid improvement was observed. In about a fortnight all the children recovered from their hemeralopia without any treatment, and the affection never returned.

The fact that all the children simultaneously were taken sick after exposure to miasmatic influences, and the fact that the disease disappeared directly after removing the children from the unhealthy locality, show very clearly how much importance is to be attributed to miasmatic influences in the etiology of hemeralopia.

A CASE OF TRAUMATIC PULSATING EXOPTHALMUS, PARTIALLY CURED BY LIGATURE OF THE COMMON CAROTID (DR. H. B. SANDS), TOTALLY CURED BY EXTIRPATION OF THE ANEURISMAL VARIX OF THE ORBIT.

By H. KNAPP, M.D., New York.

SINCE Prof. H. Sattler of Tübingen published in *Græfe-Sämisch's Handbuch*, vol. vi, pp. 745–948, his admirable monograph on pulsating exophthalmus, compiling all the cases, 106 in number, known up to that time, 1880, a few other cases have been published, viz., one by A. Nieden, *Arch. f. Augenh.* (German edition of these Arch.), vol. xi, p. 641, etc., 1881, the observation of which, however, is not completed; one by J. R. Wolfe, of Glasgow, in his text-book on Diseases of the Eye, Glasgow and Philadelphia, 1882, p. 381, etc., and one quite recently (*The Lancet*, vol. ii, 1882, p. 799), by Walter E. Lloyd, of Bristol, England, under the title of "A case of intra-orbital aneurism, following fracture of the anterior fossa of the base of the skull and meningitis; ligature of the common carotid six days after accouchement; extirpation of the eyeball; recovery." In the latter case, the exophthalmus made its appearance six weeks after the injury, the sight and hearing on the affected (left) side began to fail, and a constant loud whirring noise was complained of. A loud bruit was heard over the frontal and left temporal bones, and over the left eyeball which was distinctly pulsating; both murmurs ceased when the common carotid was compressed. The woman was seven months and a half pregnant, on account of which

the ligature of the common carotid was postponed. After her delivery at the regular term, the symptoms from the previous fall, as in Nieden's case, became so much worse from day to day, that six days after delivery, Dr. Lloyd ligated the common carotid. The wound healed kindly, the blindness and deafness on that side disappeared, the exophthalmus diminished, and the noise was scarcely perceptible. This is the ordinary course of such cases, ending in recovery. The further progress, however, was remarkable. At times there were acute pains in the head, the sight of the left eye was gradually destroyed, the crystalline lens opaque, and the eyeball pushed forward by what appeared to be a blood-clot. The bruit became louder, chiefly over the mastoid process and the occiput. The sight of the right eye being threatened by the condition of the left, Dr. L. enucleated the left globe. No unusual hemorrhage. "After removing the eyeball, I passed my finger into the orbit, and could feel a firm but somewhat elastic mass at the back." The wound rapidly healed. The patient went to the country, and returned home in perfect health.

I have given an abstract of this case, because it has one important feature in common with the case I am about to report, namely, the ligation of the carotid improved the exophthalmus only temporarily, and the eyeball had to be removed afterward. The author reports the case as cured, but I would ask him, in the interest of science, to make, after some time, a supplement to its history, telling us, what has become of the firm but somewhat elastic mass which he left at the back of the orbit. Did it shrink or increase? The time elapsed since the operation is too short to terminate the history of the case by the word recovery. The carotid was ligated on Oct. 10, 1881; the eyeball removed July 6, 1882; the case was published Nov. 11, 1882, so that only four months intervene between the removal of the eyeball and the publication of the article. In the case reported below, the ligature of the common carotid cured all the symptoms consequent upon the injury, except the exophthalmus, which was temporarily improved, but in the course of two years increased so much that the cornea was destroy-

ed by exposure, and a cure effected only by the extirpation of the globe and a large pulsating mass which filled the whole orbit and protruded considerably beyond it.

The history of the case is as follows:

Mrs. K. C. Barrett, of New York, presented herself at the New York Opththalmic and Aural Institute, Nov. 19, 1880. She was forty-eight years of age, and gave the following history: She had always been well until September, 1873, when she was struck on the left temple with a club by a woman, who had been drinking wine with her. She was somewhat out of her mind for several days, not knowing anybody. In the course of three weeks she recovered her senses. The injury caused complete left-sided facial paralysis, which has never entirely disappeared. Soon after the hurt, the eyelids were swollen, the eye protruded, but was pushed back by her physician. The eyelids could not be closed, but the sight was good. In the course of months she heard a throbbing, whirring noise in the left side of her head. It was constant, grew steadily more intense, and caused her the greatest distress. Six months or a year after the injury—she does not exactly remember when—the eye was distinctly pushed forward; toward the end of the first year the blood-vessels in the lids began to dilate, and continued enlarging steadily ever since; the veins in the adjacent regions of the eye participated in the process to a very great extent. About four years after the injury, the vision of the left eye began to be impaired, and in two years more was reduced to quantitative perception of light. When she came to the clinic, seven years after the injury, she presented the following condition:

The eyeball protruded so that the lids could not be closed over it. The protrusion was directly forward and somewhat downward. Mobility preserved, but limited in all directions. Tension, cornea, iris, and pupil normal. The lens was opaque (cataracta matura), perception and projection of light good. The lids blue-red and greatly swollen. The lids, temple, forehead, nose and upper part of the cheeks were pervaded by a dense network of tortuous and dilated blood-vessels, some red, some bluish, varying in size from a thin straw to a large quill, all of them pulsating visibly. The skin through which the dilated vessels passed was swollen and red, the whole was a repulsive picture of great disfigurement. The facial paralysis was still marked. The pulsation was imparted to the eyeball and could be felt everywhere.

With the stethoscope aneurismal whirring was heard wherever the blood-vessels were distended, most markedly over the upper lid. The same bruit was audible and well pronounced in the mastoid and temporal regions, and, though fainter, over the other parts of the skull. The hearing was good and had never been affected. The other eye was normal in position, structure, and function.

From the history and the present condition, the diagnosis of **traumatic pulsating exophthalmus, due to arterio-venous communication in the left cavernous sinus, after a rupture of the internal carotid** was unhesitatingly made, and was strengthened by the fact that compression of the left carotid stopped the noise in the mastoid region, and diminished but did not entirely remove the pulsations in the face. I did not expect any benefit from methodical compression of the carotid, but thought ligation of the common carotid indicated. I sent her to Dr. H. B. Sands, who was of the same opinion, and at my request was kind enough to take the surgical part of the case under his care. At the New York Ophthalmic and Aural Institute he "tied the left common carotid on Nov. 29, 1880; a carbolized catgut ligature being applied to the artery just above the omo-hyoid muscle. No spray was used; but the wound was washed with a solution of carbolic acid (1–20), closed with silver sutures, and covered with the usual Lister-dressing. No bleeding vessel required a ligature during the operation, and no drainage tube was inserted. The wound healed throughout by the first intention.

"Immediately after the operation, a faint systolic murmur could be heard by placing the ear over the left eyeball, and forty-eight hours later, feeble pulsation was detected in the vessels above the orbit. Neither murmur nor pulsation was entirely checked by compressing the right common carotid."

In the course of a year the swollen blood-vessels in the face gradually diminished in size and disappeared. The patient felt very much relieved, but the orbital part of the disease was only temporarily improved. During the summer of 1882, its growth took a new start. The eyeball protruded so much that the lids could not be closed over it, an ulcer developed on the lower part of the cornea, which, in spite of all precautions, led to total sloughing. The upper lid was distended by irregular, red, vermiform intumescences; the same, in a less degree, was noticed on the inner and lower sides of the orbit. This swelling was fully 3 *cm.* beyond the level of the other eye, measured 5 *cm.* in the

vertical and a little less in the horizontal diameter. Pulsation was felt in all parts of the tumor and was imparted to the eyeball; the finger pressing on the tumor was raised and depressed in corresponding rhythm. Distinct aneurismal bruit was heard over the whole tumor.

The steady increase of the "orbital aneurism" during the last six months, the complete exposure of the eyeball, in which, after the sloughing of the cornea, panophthalmitis was imminent, seemed to necessitate the removal of the globe. The patient readily consented to this operation, and, further, gave us discretionary power to take such measures concerning the tumor as, after the enucleation of the globe, we should find expedient.

I performed the operation with the kind assistance of Dr. Sands and the staff of the Hospital, on October 12, 1882. The enucleation was made in the usual manner, though with great caution, so as not to cut into the parietal leaf of Tenon's capsule, which might have opened one of the many dilated blood-vessels. In this way the removal of the globe was completed with scarcely any hemorrhage.

On palpation the whole orbit and adjacent region was found to be filled with an irregular, but connected, pulsating mass, no part offering any particular facility for ligation. I, therefore, thought it possible and best to remove the tumor as a whole. After enlarging the palpebral fissure toward the temple by an incision through the skin, I carefully dissected the large blood-vessels in the upper part of the tumor from the overlying skin, with cautious strokes of the scissors, as is done in the operation for incarcerated hernia. When I had proceeded to the orbital margin, I found that the vascular mass pressed directly against the bony walls, yet was separated from them by the periosteum and a thin layer of connective tissue, into which I burrowed with squint scissors, protecting the vascular structures with my finger. Proceeding cautiously, I found that in the depth the connection between the tumor and the orbital wall was looser, and could be severed with the sharp handle of a scalpel. Penetrating in this way at the outer-upper corner into the depth of the orbit, I found that near its apex the tumor contracted into a single resistant, pulsating vessel, about as thick as my little finger. As it could be easily compressed against the bony wall of the orbit, and in case of need be tied, I felt sure that the hemorrhage was under control, and I proceeded with more assurance to free the vascular

mass from its surroundings. Once the tumor was cut into and bled profusely, but the hemorrhage was immediately arrested by compressing the above-mentioned afferent trunk. This compression for the sake of safety and convenience, was continued during the rest of the operation, which, therefore, required less caution, and could be done more expeditiously. When the whole tumor was separated from its surroundings, a ligature was placed around the pedicle as near the apex of the orbit as possible. Then the pedicle was cut, as I thought, behind the ligature, but it was found that the thread was cut also. The distal end of the pedicle consisted of a large gaping blood-vessel, to which the clearly visible proximal end corresponded. We all were astonished to notice that it did not bleed, yet, for precaution's sake, a ligature was passed around it.

The contents of the orbit had been cleanly removed, so that on all sides the shining periosteum was visible. The extension of the outer commissure was closed with two silk sutures, the wound cleansed with sponges and ordinary water, covered to its whole extent with gold-beater's skin, and filled with a thick pad of absorbent cotton, held by a flannel roller. The operation had taken an hour and twenty-five minutes, the patient being constantly under ether. It was accompanied by very moderate hemorrhage, and followed by none.

Twenty-four hours after the operation the dressing was removed; it was soaked with blood and smelled offensively. The cavity was washed out by means of a fountain syringe with a weak (about one-half per cent.) solution of carbolic acid, and covered with a pad of absorbent cotton. The next day, no smell; the wound looked healthy and clean; no redness or swelling at its edges; no fever. The same cleansing of the wound was done twice daily. The stump of tissue at the apex of the orbit mortified and fell off. There was no smell from the wound and no discharge, but a scant secretion from the clean granulating surface. The cavity of the orbit became steadily smaller, but did not close altogether. A small recess remains which looks like the cicatricial mucous membrane in cases of old trachoma. It is whitish-red and moist, secreting a small quantity of muco-pus, which the patient has to wash out twice daily. The edges of the lids are somewhat overhanging the cavity.

I should not omit to mention that three weeks after the operation, when the recovery was proceeding favorably, the patient

suddenly had an epileptiform attack; her body was stiff, the face livid, the mouth foaming, the extremities jerking, unconsciousness complete. She became quieter after a subcutaneous injection of chloral hydrate, made by Dr. B. Scharlau. Her mind was feeble and rambling for two days after, and she had no recollection of the attack. Her relatives said that she had had similar attacks before the injury, and one after it.

At present, almost eight months after the last operation, she feels quite well. Her mind is much steadier than before. The vascular swellings which disfigured her face so much have all disappeared. The skin of her face is clean and smooth, and her complexion is healthy. There is no noise in her head; and the hearing on both sides is equal and about normal. The tympanic membranes normal. The other eye is good. She makes her living by washing and sewing, which she can do without inconvenience.

The mass of the removed tissue was examined after having lain in Müller's fluid two days. It formed a round tumor, 55 *mm.* in diameter, 22 *mm.* in height. At the posterior end was the normal optic nerve, transversely cut. Its sheath and subvaginal space were normal. The exsected orbital portion of the optic nerve was 13 *mm.* long, and broadened toward the eyeball. Tenon's capsule, out of which the globe had been enucleated, showed a plain, smooth surface, without any orifices of blood-vessels. Near the optic nerve was a large blood-vessel, its calibre 6 *mm.* in diameter, its walls fully 1 *mm.* in thickness, and smooth and shining at their inner surface. This was the afferent blood-vessel, cut near the optic foramen. It dilated into a bag-like cavity, a part of whose wall was smooth, another rough, from old deposits of coagulated fibrine. The cavity had two outlets, viz.: one larger blood-vessel passing around Tenon's capsule into the anterior tissues of the orbit; another vessel branching off at right angles, connected with another large cavity, fully 2 *cm.* in diameter, the walls of which were, like that of the first cavity, partly smooth, partly rough, from fibrinous deposits. A thin-walled blood-vessel, about the size of a quill, passed into the soft tissue. Near by was an empty sac, evidently a blood cavity, the outlet of which, however, could not be found.

Sections in different directions through the bulk of the tumor, brought to view adipose connective tissue, muscles, here and there a nerve trunk, and a number of smooth, thin-walled, vascular cavities, some of which were divided and subdivided by delicate and smooth partition walls, presenting the typical structure of a cavernoma. The thin walls of some of these cavities were suffused with blood, their inner surfaces smooth and shining like a serous membrane. Between the two larger cavities described above, a compact nodular tumor was situated. It was the lachrymal gland, and showed no abnormity of structure.

Remarks.—It is needless for me to discuss the disease of which this case forms an example, after Sattler has described it so exhaustively. I only desire to point out what is unusual in our observation.

1. The time for the development of the pulsating exophthalmus, from six to twelve months, is longer than in most cases, yet not unprecedented, and is explained according to Sattler, by the presence of a small or imperfect rupture of the internal carotid, which gradually extends and leads to the full development of the symptoms. The time of development was seven years, unusually long also, and the dilatation of the blood-vessels was, it seems, as great in degree and area as in any of the cases on record.

2. The ligation of the common carotid had no very striking immediate effect, except that it stopped the subjective noises. The pulsation and bruit in the dilated vessels of the face slowly diminished and disappeared, the vessels of the orbit diminished only for several months, then they slowly increased again, and two years after the operation they increased rapidly, especially those along the eyebrow, and a large bluish thin-walled vessel at and below the inner commissure; they pulsated strongly, as did the whole mass of orbital tissue, which protruded considerably beyond the base of the orbit and caused the cornea to slough.

3. A relapse of the disease thus being manifest, and showing an alarming rapidity of progress, its arrest was deemed of vital importance for the patient. Among the

different methods recommended and practised, I chose the one, extirpation, which I find mentioned in Sattler's compilation of one hundred and six cases only three times, namely: 1, Morton's case (Sattler, No. 70), excision of the whole contents of the orbit, excessive hemorrhage, arrested by glowing iron and compression; recovery; 2, Frothingham's case (Sattler, No. 80), ligation of common carotid, retardation of increase for three years, then rapid growth; extirpation with very considerable hemorrhage; 3, Hansen's case (Sattler, No. 106), ligation of common carotid; return of symptoms as early as the second day; three weeks later, extirpation of the tumor with preservation of globe; profuse hemorrhage, arrested by per-chloride of iron. Frothingham's case was a pulsating angioma, Hansen's, a pulsating adenoma of the lachrymal gland, with enormous dilatation and hypertrophy of blood-vessels.

4. The nature of the relapse in our case was of two kinds: the bulk was an **aneurismal varix,** the smaller part a **pulsating cavernoma**, the mode of development in both, I think, was the same. It seems most probable that, by the ligation of the carotid, the perforation of the internal carotid had been diminished, but not completely blocked. The afflux of arterial blood from Willis' circle was sufficient to cause the continuation of the pulsation in the orbital veins, but not in the facial. The study of the literature, especially that of Nélaton's cases, leaves no doubt that the large pulsating vessels were dilated veins with thickened ("arterialized") walls, and not arteries. I refer the reader to Sattler's monograph.

5. The large afferent blood-vessel, which was cut at the apex of the orbit, was the superior ophthalmic vein. Evidence of this is furnished by the autopsy of the second case of Nélaton, described and illustrated in Sattler's monograph, p. 848. The remarkable feature noticed in our case, that the vessel, after it was cut, did not bleed, has its analogy in the fact, that the bleeding in vascular tumors is considerable only when we cut into their mass, but not when we cut the afferent vessels at their borders. The vessel in our case evidently was small during its passage

through the superior orbital fissure, and its contraction after it was cut, may have been facilitated by the prolonged compression during the operation, and by retraction into the narrow bony fissure after the large elastic tumor, which drew it into the orbit, had been removed. In Nélaton's case, the superior ophthalmic vein was very small, almost of natural size near and in the superior orbital fissure, but in the orbit it was enormously dilated. That the blood-current in this vessel was reversed, centrifugal instead of centripetal, as it always is in these cases of arterio-venous communication, was, in our case, further evidenced by the fact that the hemorrhage from cutting into the periphery of the orbital tumor was arrested by compression of this vessel at the apex of the orbital pyramid.

6. In explanation of the cure of the arterio-venous communication in the cavernous sinus by the extirpation of the contents of the orbit, I assume that the sudden stoppage of the external outlet of the blood must have been followed by thrombosis in the parts of the cavernous sinus adjacent to the entrance of the ophthalmic vein, and the thrombus must have plugged the perforation of the internal carotid still present at that time.

ON CORNEAL GANGRENE PRODUCED BY INANITION.

By Dr. J. THALBERG, St. Petersburg.

Translated by Dr. Porter Farley, of Rochester, N. Y.

DURING the last two years, I have had the opportunity of observing several cases of corneal gangrene, caused by inanition, not preceded or accompanied by inflammatory symptoms. They were observed in the out-door department of the Elizabeth Children's Hospital, and in the Ophthalmological Department of the Semenow Military Hospital. In the Graefe-Saemisch hand-book there is only a brief history of the few such cases hitherto known.[1] I therefore think it will be useful for me to publish, somewhat in detail, the history of the cases which I have observed.

Most of the cases occurred in sucklings. The corneal disease was generally bilateral, and was preceded by a more or less pronounced xerosis conjunctivæ oculi; but the eyeballs were otherwise healthy, with no symptoms of irritation. The most frequent cause for this bilateral corneal gangrene appeared to be malnutrition of the child, coinciding in time with anæmia or fasting in its nursing mother. In some of the cases, however, the cause appeared to be a disease in the child only,—such as entero-catarrh or pneumonia, and in these, probably on account of their early fatal ending, there occurred only a partial unilateral corneal destruction. On the other hand, a long-continued fast on

[1] "Handbuch der gesammten Augenheilk.," Bd. xvii, 1, p. 225.

the part of a previously well-nourished mother, inducing great emaciation in the child, but no actual disease, was sufficient to cause rapid destruction of the cornea. These seasons of fasting seemed to be the special occasions for the occurrence of corneal gangrene in children already sick, even when the mothers claimed to have a sufficiency of milk. The number of cases increased toward the end of these fasts, while at other times there occurred only occasional cases of unilateral corneal gangrene in the out-door department of a clinic much frequented by atrophic children of the poorest classes.

In a part of the cases, after the occurrence of a slight xerosis of the conjunctiva oculi, or even without this prodromal symptom, suddenly the entire surface of both corneæ became dull and clouded, and broke down into a soft yellow mass, the condition extending, in a few days, to the depth of the membrane of Descemet. In another class of cases there existed, for some time, a decided xerosis of the conjunctiva oculi, or of the cornea, while the clouding, softening, and disintegration began at the corneal margin, and only at certain places penetrated quickly the corneal substance, while they spread slowly over the entire corneal surface. The more or less rapid destruction of the cornea evidently depended directly upon the poor nutrition of the child alone, or of both the mother and child. In those cases where insufficient nutriment and disease were the coexisting causes of the corneal destruction, the process was very rapid and the result the most deplorable.

Under the conditions last described, the necrosis began by a uniform superficial clouding of the surfaces of the corneæ, either both simultaneously, or one shortly after the other, like the clouding seen in a slight superficial keratitis, or in the dead body. Simultaneously with this superficial clouding, or, at latest, upon the next day, grayish-white spots appeared at the centre or near the margin of the cornea, which soon assumed a yellow color and began to break down into minute shreds of mortified tissue. From these points the destruction spread rapidly over the entire cornea. In other cases, a milk-white stripe appeared, running across

a cornea which, the day before, had been entirely clear. The next day, the tissue covered by this stripe turned yellow and began to break down, while the clouding of the other parts now first began to appear. In all the cases the corneal tissue was nearly completely destroyed within three or four days, and by the end of the week the membrane of Descemet was completely denuded. For instance: one of these poorly-nourished sucklings was brought to the clinic on account of a slight redness of the edges of its lids, and of a forcible closing of the eye caused by xerosis. The corneæ were clear. On the next day there appeared on one cornea a broad white stripe, corresponding to the palpebral fissure, and a second stripe at the lower margin of the cornea. On the following day these parts of the cornea began to break down, and the remaining parts had begun to assume a white color, with here and there deep penetrating gray spots. By the sixth day the disintegrated tissue of both corneæ was almost entirely thrown off, so that here and there the transparent membrane of Descemet was laid bare. Another child was brought in, from whose corneæ the mortified tissue was already partially exfoliated. Its mother had noticed a clouding of the corneæ for the first time only two days before. When the exfoliation of the necrotic tissue began, there appeared a puffy swelling of the conjunctiva, and increased secretion.

The result of these rapidly progressing cases, when the children survived, was either phthisis or staphyloma of the corneæ. I happened subsequently to see two of these patients. In one of them, in the course of three or four weeks, phthisis of the corneæ had been the sequel of bilateral rupture of the membrane of Descemet; in the other, after two months there was phthisis of the cornea on the left side where rupture had occurred, and on the right side was a hemispherical staphyloma with a dry cicatricial surface. The staphyloma could still be covered by the lids and its lower, outer quadrant was still somewhat transparent. The mother stated that the child could see with this eye and that it grasped at objects held before it.

In cases where the mother in spite of her fasting was well

nourished and rosy, and the sucklings had suffered in their nutrition only by their own disease, and in those cases where the children being larger had been weaned and had become marasmic through long sickness and unfavorable environment, the gangrene of the cornea, although it might be bilateral, was slower in its course, and was generally preceded by a xerosis of the conjunctiva oculi and of the cornea. There appeared upon the conjunctiva oculi, near the outer canthus, a dry triangle covered with a fine white foam. When this foam was wiped away the subjacent conjunctiva presented a fatty, shimmering, crumpled appearance, and the tears did not spread out uniformly upon it.

This dry foam-covered spot upon the conjunctiva was the first noticed indication of the insufficient nutrition of the otherwise well-developed child. Later, this dryness spread over the cornea and over the other parts of the conjunctiva not covered by the lids. It disappeared with the occurrence of a catarrhal swelling of the conjunctiva; or where this catarrh already existed the dryness appeared only on the surface of the cornea. This dryness of the conjunctiva and cornea caused the child to keep the eyes forcibly closed, and this was generally the reason why the mother brought it to the clinic. Simultaneously with the xerosis or very soon after it a superficial clouding appeared about the margin of the cornea, which assumed a whitish appearance like ground glass. At first the iris could still be well seen. As this whitish appearance invaded the central portion of the cornea the marginal portion assumed the appearance of a dirty yellow ring, and at places its disintegrating tissue was thrown off in minute shreds, so as even to lay bare the membrane of Descemet. A careless opening of the eye easily caused a rupture of this membrane. If the patients at this stage submitted to treatment and came into more favorable environment, the cloudiness of the cornea began to clear up, and healing of the part where ulceration had occurred went on rapidly. The same was observed in those cases which were treated as out-door patients, provided the mother was properly fed and the child was regularly brought for treatment. In these cases a small peripheral spot or a

prolapse of the iris which did not interfere with vision was the only trace finally left of the corneal disease. If, on the contrary, the children continued to have poor care and were not brought regularly to the hospital, the destructive process extended rapidly over the whole cornea. The membrane of Descemet was soon entirely denuded and bulged forward, as in the cases first described. The result was phthisis or total staphyloma of the cornea. In these cases, as in the very rapid ones, a catarrhal swelling of the conjunctiva accompanied the exfoliation of the necrosed tissue, and during this process the xerosis disappeared. The disease at this stage resembled a blennorrhœa with secondary corneal gangrene, and before my attention had been directed to the manner of their beginning, I had mistakenly recorded two of the cases as such in the hospital case-book.

It is apparent that most of such children will succumb to the disease, and to marasmus before cicatrization of the cornea takes place. If, however, a child blinded by corneal gangrene should subsequently come under observation, one would be very likely to attribute the bilateral phthisis of the cornea to blennorrhœa.

Unfortunately, in most of my cases, both corneæ were already lost when the child was first brought in. The case of a beggar's child, which had begun gradually and had advanced without any care to entire loss of both corneæ, showed such temporary improvement under treatment as an out-door patient, that it may be fairly assumed that if this child, or even the rapid cases, could have been promptly received into the hospital, the entire destruction of the cornea might have been prevented. I have, therefore, established the rule to receive immediately into the hospital all children who have incipient xerosis of the conjunctiva oculi or of the cornea, whether due to anæmia of the mother or disease of the child. Such cases are certain to appear at the children's hospital, particularly after the seasons of long religious fasts.

The cases of sucklings with corneal gangrene which I here publish, appeared, with two exceptions, after the long fast at the end of March and the beginning of April, or

after the two weeks' fast in August. The two exceptions were cases of bilateral corneal gangrene, due to marasmus following pneumonia and catarrhal enteritis. But even in these the nursing mother was very anæmic.

It is not to be supposed that the keeping of even a long fast by the mother can cause a corneal gangrene in her suckling infant, provided she herself remains healthy and has the necessary variety of fast-food from which to choose. I do not know whether a similar disease of the cornea occurs among infants in the more affluent classes. During my practice for three years in the Ural, where the people observe the fasts very strictly, but are in good circumstances, and in particular have a good fish diet, I never saw such a case among the thousands of diseases which there came under my notice. When, however, the poorly-fed, anæmic woman of the lower class is compelled for a long time to subsist upon the meagre fast-diet, or when the hydræmic, nursing, pauper mother is compelled to fast against her will, it is no wonder if this has an effect upon her suckling child and its cornea, because disease in the mother enters as a factor in the case.

At all events, my fear of finding incipient corneal gangrene was subsequently confirmed when a nursing mother, who had become anæmic from fasting or from some other cause, brought her child to the clinic on account of disease in its eyes.

I often saw both slight and severe cases of xerosis of the conjunctiva oculi, some of them annular in form and surrounding the cornea, in patients from three to seven years of age, and even older, who were brought to the out-door department of the children's hospital, on account of infiltration of the cornea. At the end of the long fasts children at other times well-fed and rosy-cheeked, but who had lately had only the fast-diet, were brought to the clinic on account of a dryness of the conjunctiva, which caused them constantly to keep their eyes forcibly closed. The xerosis in these children was directly dependent upon their lowered nutrition or the use of the fast-diet, and in the absence of any general disease had no evil effect upon the cornea. It dis-

appeared upon the use of proper food or with the end of the fast. Xerosis of the conjunctiva is also often seen here in adults (soldiers and workmen), who come to the clinic to be treated for hemeralopia, due to the same cause. In such cases the xerosis is only an indication that they have fasted, and has no bad consequences so long as the person himself and his cornea remains well in other respects. As, however, a corneal infiltration in poorly-fed sick children is often the starting-point of a rapid destruction of the cornea, even so I have satisfied myself that marginal phlyctenulæ and corneal infiltrations break down very rapidly in adults who have become so reduced by sickness or insufficient nourishment, that a decided xerosis of the conjunctiva occurs. I recall one case in particular, that of a soldier, who was received into the hospital on account of a marginal phlyctenule of the size of a pin head, but without any general disease. Simply in consequence of poor nourishment he acquired a severe xerosis of the conjunctiva oculi of both eyes. After two days the phlyctenules could be picked away with the forceps in the form of gangrenous plugs, revealing such a loss of substance as to threaten momentary rupture. In the case of another patient, who was much reduced by profuse diarrhœa, a corneal infiltration caused by an inverted cilium after the occurrence of a xerosis of the cornea, broke down in a few days, leaving a very considerable loss of substance.

Incipient gangrene of the cornea was several times observed in the military hospital as a consequence of severe constitutional diseases, such as typhoid fever, scurvy, and profuse diarrhœa, following ulceration of the intestines. It appeared either upon one or simultaneously upon both corneæ, preceded by a dryness and superficial clouding, or the patients first presented themselves at a time when exfoliation of the mortified tissue had already begun, and without any noticeable xerosis of the conjunctiva or cornea. Without any accompanying symptoms of irritation there appear in these cases, either at the centre or upon the margin of the uniformly clouded cornea, one or several gray-white points of softened corneal tissue, which quickly enlarge and deepen,

soon causing a rupture of the membrane of Descemet. In one case the inner half of the right and the outer half of the left cornea were both covered with such gray points, which were already confluent upon the corneal margin, and formed a crescentic area of softened tissue occupying half the peripheral zone of the corneæ. The xerosis of the corneæ caused the patients to keep the lids constantly closed, and they complained of an uncomfortable feeling of dryness. The chronic catarrhal swelling of the conjunctiva, which happened to be present, assumed a lax, livid appearance. I never, however, saw such rapid gangrene of the entire cornea in large children and adults as in sucklings. These older patients were already in the hospital or came early to it.

As soon as the proper treatment and the consequent improvement of the general health caused an arrest of the gangrene and induced a reactive keratitis, this in turn caused in adults an iritis, with severe ciliary neurosis, pericorneal injection, the formation of posterior synechiæ, and hypopyon. Even in those cases, where, during the process of healing, the eye appeared to remain quiet without pericorneal injection and ciliary neurosis, synechiæ were subsequently observed upon the pupillary margin opposite the cicatrized ulcers.

The result in those cases which were already in hospital, and which were properly treated, was quite satisfactory. With the disappearance of the xerosis, ulceration ceased, and the cornea began to clear up. A peripheral defect, even with rupture of the cornea, healed without prolapsus iridis, leaving only an insignificant leucoma. In a case of central rupture with adherent corneal scar, and distortion of the pupil, there nevertheless remained so much transparent cornea that vision was subsequently much improved by iridectomy.

By the death of a soldier, sick with ulceration of the intestines, I obtained for microscopic examination an eyeball, in which there was still xerosis, but in which healing of the ulceration had begun. The epithelium of the cornea was reduced to a simple layer of round and cylindrical epidermal-like cells, resting upon Bowman's membrane. The epithe-

lial cells appeared upon section to have shrunk down to thin scales, with a thread-like nucleus. At the corneal margin they were shrunken down to a single layer of round cells. Upon the irritated places of the cornea and upon the margin of the healing ulcers, the shrunken cells of the middle and deep layers appeared to be again swollen up and multiplied by cell division.

Speaking of corneal gangrene, Förster[1] says: "We may regard this destruction of the cornea as a kind of necrosis due to insufficient nutrition, like the bed-sores which appear in typhoid fever and in other severe constitutional diseases, or like the corneal gangrene in diabetes." In the cases here described, the insufficient nutrition was evidently the cause of the destruction of the cornea. The pressure of the lids, which, owing to their forcible closure must often have been considerable, appeared to exercise no influence in causing the gangrene, as the destruction seemed to begin at no determined place upon the cornea. It started sometimes at the margin and sometimes at the centre. Moreover the persistent blepharospasm did not cause gangrene of the cornea in generally well nourished children, who in consequence of fasting were suffering from extensive xerosis of the conjunctiva. Neither did the dryness and splitting of the epithelium cause by themselves a progressing disease in the corneal tissue, such as Horner[2] describes, since clouding and ulceration of the cornea often appeared together without preceding xerosis. The inciting cause for the ulceration of the cornea, appeared to be simply the insufficient supply of nutriment in consequence of an underlying general disease. This was indicated, too, by the dryness of the corneal epithelium and of the conjunctiva surrounding the cornea, as also by the livid color and laxness of the swollen, catarrhal conjuctiva. We see in blennorrhœa of the conjuctiva how soon an excessive swelling of the conjunctiva with consequent obstruction to the circulation, can cause gangrene of the cornea. It seems to me that the occurence of gangrene in the non-vascular cornea of feeble patients, may well be

[1] *L. c.* Bd. vii, 1, p. 227.

[2] Gerhardt, Handb. d. Kindererkrankungen Bd. v, 2, p. 330.

compared to that gangrene of the extremities which follows severe constitutional disease,—for instance typhoid fever. During the late Turko-Russian war, I several times saw cases where there was great weakness of the heart's action, and sluggishness of the circulation, in which improper care, a slight hanging downward of the limb, a cold barrack, etc., sufficed to cause, in a single night, stasis in the extremity, and gangrene of an entire forearm or leg.

Pflüger[1] in his experiments with Fluorescine, has shown that the course of the nutrient stream in the cornea is from the periphery toward the centre, that the nutrient supply for the superficial layers comes from the conjunctiva, while that for the deep layers is from the sclera, and that in respect to the nutrition of the cornea, the aqueous humor has little influence. Perhaps with the occurence of corneal gangrene there may be the formation of thrombi in the pericorneal vessels. The truth of this theory has not been proved, but it well explains the sudden clouding and ulceration of a previously clear and healthy cornea, with slight or no noticeable xerosis of the conjuctiva, as well as that ulceration which after a long preceding xerosis of the conjuctiva begins at the margin of the cornea, and proceeds gradually toward the centre. I remember the case of a boy from the Dorpat clinic who had been operated on by Prof. v. Oettinger, for the removal of a dermoid cyst from the temporal side of the right eyeball, within the recti muscles. The operation necessitated a very considerable exposure of the eyeball by removal of the conjunctiva, and of the capsule of Tenon with the wounding of vessels and nerves. After three or four days, the eyeball having meanwhile been kept entirely quiet, there appeared at the upper margin of the cornea a brownish-yellow line, which grew gradually wider. Soon the entire cornea became necrosed. This necrosis may have been due to the wounding of the nerves, but a more probable cause seems to have been the deprivation of nutriment caused by the extensive denudation of the eyeball.

In the treatment of this corneal gangrene, very good re-

[1] *Klin. Monatsschr. f. Augenheilk.* 1882, März.

sults were obtained by the use of eserine, in the form of salve, composed of eserine and vaseline in the proportions of 0.05 : 8.0. The vaseline soothed the unpleasant feeling of dryness, and caused a temporary disappearance of the xerosis. The eserine salve was used only once a day for the out-door patients, but for those in the hospital it was applied two or three times daily, and was supplemented with chlorine water, and the application of a bandage saturated with a four-per-cent. solution of boracic acid. Very soon after the eserine had time to take effect, the ulceration ceased and the cornea began to clear up. The diminished pressure within the anterior chamber, as manifested by that best of all manometers, the evident sinking of a keratocele after the use of eserine, and the greater freedom thereby allowed to the circulation, may, perhaps, be the cause for the improvement. At all events, in the corneal gangrene caused by blennorrhœa neonatorum, the use of eserine is followed very promptly by a decided vascularization of the corneal margin, an arrest of the gangrene, and a rapid healing of the ulcer. It was evident, also, that the cleaning of the cornea and the arrest of the gangrene was not simply due to the more favorable hygienic surroundings of the in-door patients, but to the use of eserine; for in spite of the persistence of the general disease in the in-door patients, and in spite of the continued unfavorable surroundings of the out-door patients, the corneal ulceration ceased, and the xerosis disappeared upon the use of eserine. The ulceration of the cornea healed under this treatment, even when the general condition in adults remained unimproved and had, later, a fatal termination. In a soldier much reduced by typhoid fever, pleurisy, and scurvy, the cloudiness and dryness of the cornea was at first diagnosed as superficial keratitis, and atropine was used in the eye for some days without lessening the clouding of the cornea; on the contrary, ulceration proceeded, and rupture took place at its centre. The condition of the cornea improved immediately upon the use of eserine. Its effect was very remarkable in the case above mentioned, that of the suckling child of the beggar woman living under the most unfavorable

conditions, and treated as an out-door patient. After eserine had been applied for two successive days, the cornea, which before had been diffusely clouded and dry, was found to be absolutely clear, but the next day being Sunday, the child had no treatment until Monday, when an excessive clouding had reappeared.

A small hypopyon, occurring in an adult after ulceration of the cornea in consequence of a complicating kerato-iritis, disappeared in two days upon the use of eserine, but reappeared immediately when atropine was used in order to break up a synechia which was forming. Immediately after the arrest of the gangrene, however, atropine must be instilled in order to prevent adhesions of the iris. It can be safely used at this stage, for the danger from ulceration is passed.

In the children's hospital both eserine and atropine are used only in the form of vaseline salve, and with very good results. The use of the vaseline salve has a great advantage over that of the aqueous solutions of these alkaloids in this respect; that the latter are immediately washed out by the tears of the crying child so that scarcely any effect is obtained by a single instillation, while the vaseline salve adheres to the conjunctiva and is not so easily washed away. This is the more important for the reason that, to avoid the danger of poisoning, these alkaloids are not given out to be used at home, but are applied daily at the out-door clinic by the physician himself. Much more is accomplished in this way by a single application than when the remedy is given to the mother with instructions to use it once a day. It is difficult for her to control the crying child, and she generally appears next day at the clinic with the child and the medicine.

Upon reviewing the subject, we must conclude that long and wasting diseases with insufficient nutriment, particularly the milk of an anæmic mother, may be the factors initiating corneal grangrene which is generally bi-lateral and preceded by xerosis of the conjunctiva oculi and of the cornea; that the disease is more rapid and severe in sucklings than in larger children and adults; that the keeping of a long-con-

tinued fast by a poorly nourished anæmic mother is by itself sufficient to produce bi-lateral corneal necrosis in a healthy suckling, and still more likely to cause it in a sickly one; that eserine gives satisfactory results in the treatment of corneal gangrene.

CASE 1.—N. A., four months old, was brought to the hospital April 13, 1881, on account of disease of the eyes, had a slight broncho-entero-catarrh and was much emaciated. The mother was anæmic and was fasting, but claimed to have sufficient milk and to be perfectly well. She had three other healthy children. The child kept its eyes fast closed. Upon opening the lids a dry triangular space covered with foam was seen upon the conjunctiva oculi at the outer canthus. After wiping away this white foam the conjunctiva had a fatty, finely corrugated appearance. The tears did not spread uniformly over it (xerosis).

The conjunctiva palpebr. and the margins of the lids are slightly congested. Both corneæ are clear. A weak solution of lead was given to be used as eye drops. On the next day without any inflammatory symptoms, a white stripe had extended horizontally across the cornea of the left eye, while the other parts of the cornea showed a slight superficial clouding and appeared somewhat dry. The right cornea was still clear. This, however, became clouded on the third day; meanwhile the left cornea had begun to ulcerate. On the sixth day both corneæ were nearly destroyed; the conjunctiva was soft and swollen, and was secreting copiously. The case looked upon casual inspection like one of blennorrhœa which had led to corneal gangrene. It was a month and a half before I again saw the mother and child. At that time there was phthisis of the left cornea and staphyloma of the right. The mother stated that the child could see and grasped for objects held before it. Its general condition was much improved but it was still quite emaciated.

CASE 2.—J. F., seventeen weeks old, much emaciated and sick with diarrhœa, brought to the clinic March 21st. On right eye is xerosis of the conjunctiva; the cornea uniformly cloudy, but the iris can still be discerned. The disease is further advanced in the left cornea which is ulcerated at several places. The left conjunctiva is livid, lax, and swollen, and secreting to some extent; no xerosis of the conjunctiva oculi. The mother is anæmic and complains that she has but little milk in her breast. Being asked

if she was fasting, she said she was doing so against her will, as her husband was a drunkard and she herself a beggar. The child was treated with eserine-vaseline salve as an out-door patient. After two days the right cornea had become clear and the gangrene of the left cornea was arrested. The next day was Sunday, on which there is no reception of patients in the out-door department, and consequently the application of eserine was omitted. On Monday the right cornea was again clouded, and much more so than at any time before. The gangrene of the left cornea had recommenced. On opening that eye there occurred a rupture at the corneal margin and a prolapse of the iris. The child was brought to the clinic on the two or three following days, but it grew gradually weaker, and the corneal necrosis slowly progressed. Meanwhile the mother had become disabled from a dropsical swelling of the leg, so that she was obliged to go into a hospital, and the child appeared no more at the clinic.

Case 3.—J. A., two months old, emaciated, suffering from slight bronchial catarrh, but has no diarrhœa, was brought to the out-door clinic Aug. 17th. The mother was nursing the child, was anæmic, and had been keeping a two weeks' fast, but claimed to have plenty of milk, and to be perfectly healthy. Both corneæ of the child were necrotic, and the tissue at several places was exfoliated. Rupture of the cornea occurred upon opening the left eye. The conjunctiva was swollen at the margins of the lids, and was yielding some secretion; the margins of the lids were somewhat reddened; no injection of the conjunctiva oculi. The corneæ became clouded for the first time two days before. Eserine salve was applied once a day, to prevent the development of staphyloma. A fortnight later there was phthisis of both corneæ, but the general condition of the child was meanwhile considerably improved.

Case 4.—J. M., five months old, brought to the clinic Sept. 14th, on account of disease of the eyes; has entero-catarrh, but is not greatly emaciated. The diarrhœa has lasted for a month, but the eyes became diseased only three days previously. The mother, forty-two years old, nurses the child, and has milk enough, but is very anæmic. The margins of the child's eyelids are eczematous; the conjunctiva swollen and livid with a purulent secretion. The case resembled one of chronic blennorrhœa. The left cornea was of a grayish-white throughout its whole extent, and was beginning to break down in the centre. The right cornea was tran-

sparent. Neither eyeball showed symptoms of irritation. General treatment was begun, and eserine salve was applied twice daily. On Sept. 15th, the lower half of the right cornea showed a slight superficial clouding and dulness.

Sept. 17th.—The entire left cornea necrotic; rupture in the centre. The chemosis decreased. On the right cornea the clouding had not spread, but had sunken deeper in, and one quarter had become necrosed. Diarrhœa decreased. The child cries louder.

Sept. 20th.—Upon opening the left eye the lens fell out of it. The entire right cornea was clouded and softened; more than three fourths of its surface was exfoliating necrosed tissue.

Sept. 21st.—The entire right membrane of Descemet was denuded. The child's health was somewhat improved, and the diarrhœa decreased; it was not brought to the clinic again.

Case 5.—A. K., seven months old; brought to the clinic July 7th, much emaciated; listless, and anæmic, has scurvy, entero-catarrh, and bilateral catarrhal pneumonia. The mother has milk enough, but appears very anæmic. The child was taken with measles, severe diarrhœa, and coughing, one week ago, since which time both corneæ have become clouded. Their surfaces are dry and dull, resembling a superficial keratitis, showing here and there white specks. The conjunctiva was not dry, was slightly reddened, and was yielding a secretion. Atropine was dropped in both eyes, and the pupils were dilated. On the next day as much as a third of the left cornea had become necrosed and exfoliated. The same process had taken place, though to a somewhat less extent in the right eye. The child was not brought again to the clinic.

Case 6.—A. O., four months old, greatly emaciated, brought to the clinic April 16th, on account of her eyes. The mother, anæmic and poorly nourished, nurses the child herself; said that the child's eyes became diseased four weeks ago; that they did not suppurate at first, but only of late. Margins of lids red; conjunctiva hyperæmic and yielding a catarrhal secretion. On the right side is incipient phthisis corneæ, with prolapsus iridis. On the left side the corneal tissue is entirely exfoliated, leaving the bulging membrane of Descemet denuded. The pupil is contracted. The membrane of Descemet ruptured while the lids were being held open. There is no decided pericorneal injection. The mother had not noticed when the corneæ first became clouded. The child was not brought again.

Case 7.—W. F., two months old, brought to clinic near the end of March, sick with diarrhœa and greatly emaciated. Both corneæ are greatly clouded, but without any accompanying inflammatory symptoms. On both sides there had been an ulceration of pin-head size, and prolapse of the iris. The conjunctiva swollen and secreting. No xerosis of conjunctiva. The mother is fasting, but well nourished and rosy. After a few days' use of the eserine salve, the progress of the corneal gangrene was arrested, the corneæ cleared up, and a fortnight later the ulcers healed. A small prolapsus iridis at the corneal margin in both eyes remained as the evidence of the necrosis.

Case 8.—M. W., three years old, brought to clinic April 14th, much emaciated, sick with catarrhal pneumonia of the right lung, and severe diarrhœa. The conjunctiva oculi and surfaces of corneæ in both eyes are quite dry. The corneæ white. This whiteness of the general surface of the corneæ was assuming a yellowish tinge at the margin ; at the lower part of the left cornea the tissue in a space the size of a pin-head had softened and been exfoliated. The dryness of the conjunctiva caused blepharospasm and a slight entropion of the under lids. No inflammatory symptoms to be observed in either eye. The child was not brought regularly to the clinic, its general condition became worse, necrosis of the right cornea began, and so, on the 21st of April, it was received into the hospital. Besides general treatment, eserine salve was applied twice a day to the eyes, chlorine water was instilled once a day, and a bandage saturated in a four-per-cent. solution of boracic acid was applied. Although the general condition improved only slightly during the ensuing days, both corneæ cleared up by the 25th of April, and the xerosis improved markedly. April 28th, the xerosis has disappeared ; the child opens its eyes ; the corneal ulcers are healed. During all this time the evening temperature of the child has been above normal, and during the last fortnight the morning temperature also. The general health grew worse, and the child died of pneumonia on May 28th. During the last days of its life, no further pathological changes occurred in its eyes.

Case 9.—A. R., two and one half years old, brought to the clinic March 26th, with the statement that it had not opened its eyes for two weeks. The child is healthy and rosy, but throughout the whole fast season it has had only fast-food. There is xerosis of the conjunctiva. The limbus corneæ is dry and slightly clouded.

The corneæ are clear. There is slight hyperæmia of the conjunctiva, and redness of the margins of the lids. Milk diet was ordered, and eserine salve applied once a day to the eyes. In a week the xerosis had diminished decidedly, and the child opened its eyes. It was brought no more to the clinic.

TRANSLATOR'S NOTE.—The author gives the history of four other cases, which, in their general history, resemble those above related. They all show marked improvement under the use of eserine. Atropine, on the contrary, appeared to be useless.

A CASE OF GUMMA OF THE OCULAR CONJUNCTIVA.

By Dr. JAMES L. MINOR,

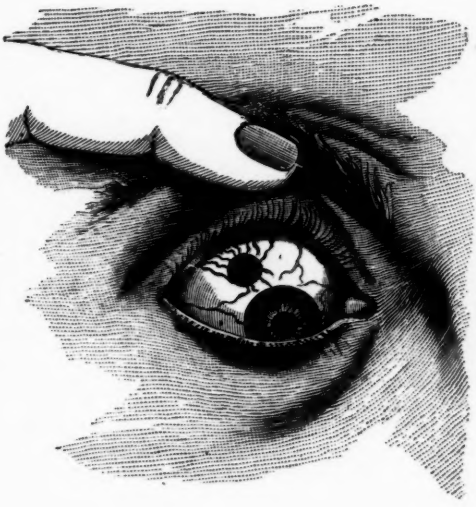
CURATOR AND MICROSCOPIST TO THE NEW YORK EYE AND EAR INFIRMARY, OPHTHALMIC SURGEON TO THE RANDALL'S ISLAND HOSPITALS.

DURING the past summer I had under my care a gentleman who presented the very rare condition described in the heading of this article.

Wm. T., æt. thirty-eight. August 3, 1882. A large, healthy-looking man, who has lost three sisters, and other members of his family, and several relatives, from phthisis. Takes cold easily, and usually suffers from one during every winter, with a troublesome cough. Had pneumonitis in '78, and since then has had three hemorrhages from the lungs. Has had gonorrhœa twice. The first attack in '65 ; the second he has just recovered from. Contracted syphilis in '65, and, following the initial lesion, appeared cutaneous eruptions, adenitis, ulcerative sore throat, alopecia, and rheumatism. The occurrence of these phenomena covered a period of about two years, during which time constitutional treatment was instituted, and continued at irregular intervals. No further symptoms of syphilis made their appearance until he consulted me. Three weeks ago the right eye became, as the patient describes it, "blood-shot, with a sense of dryness and constriction, but no pain." Thinking this an ordinary cold, no attention was paid to it until to-day, when it was accidentally discovered, on raising the upper lid, that a small tumor occupied the supro-external quadrant of the globe, above the corneal margin.

I found the eye but slightly injected, and, to a casual examination, about normal ; but when the upper lid was raised, a small cir-

cular elevation or tumor was seen in the conjunctiva, covering the supero-temporal quadrant of the globe. The tumor was four *mm.* from the corneal margin; measured nine *mm.* in diameter, and about two *mm.* in height. Its margin was sharply defined, and the surrounding conjunctiva was œdematous. Six or eight blood-vessels, coming from the *cul-de-sac*, converged toward the tumor and seemed to enter its structure, where most of them were lost; several, however, passed beyond, as far as the margin of the cornea. The tumor occupied the conjunctiva and sub-conjunctival tissue only, as it could be moved over the sclera. The color of the tumor was a dark red. At its border it assumed a yellowish hue.



The vision in this eye was $\frac{20}{16}$; and nothing abnormal could be discovered in the fundus. He was given a wash of boracic acid for the eye; and a prescription that gave him $\frac{1}{16}$ of a grain of bichloride of mercury with five grs. of potas. iod. three times a day. He was also placed on gradually increasing doses of iod. potas.

August 9th.—Some pain in eye last night, and find injection of globe more diffuse and general. The tumor has not changed in appearance; it is, however, more adherent to the sclera than it has been heretofore. V = $\frac{20}{16}$. Dr. Noyes, who saw the case to-day,

discovered a few fine, floating bodies in the anterior part of the vitreous.

August 11th.—Much better. Injection only around tumor. Tumor noticeably reduced in size. On August 23d nothing could be discovered about the eye to denote former trouble, but slight pigmentation at the previous seat of the tumor. He was dismissed as cured, on September 13th.

The patient was seen about the middle of November. There had been no further return of the eye-trouble, but he then had a gumma of the tongue about 2 *cm.* in diameter, which had broken down in the centre, leaving an ulcerating cavity that rapidly healed when the patient was placed upon the vigorous use of the mixed treatment.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1882.

By H. MAGNUS, Breslau; C. HORSTMANN, Berlin; and A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

C. E. Fitzgerald and Ferguson, Dublin; E. Marckwort and P. von Mittelstädt, Antwerp; Dantone, Rome; Hirschmann, Charkow; S. M. Burnett, Washington; Schiötz and Ole Bull, Christiania, etc.

Translated by Dr. F. E. D'Oench, New York.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE; GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL, AND HISTORICAL SUBJECTS.

1. Baudry. Simulation de l' amaurose et de l' amblyopie, des principaux moyens de la dévoiler. Paris, 1882. Berthier.

2. Baudry. De l' amblyopie unilatérale simulée. *Arch. d' ophth.*, vol. ii, No. 6.

3. Guttstadt. The invalids in the population of Prussia, Dec. 1, 1880. *Report of the Royal Prussian Statistical Bureau*, 1882.

4. Langnier. Maladies simulées de l' appareil visuel. *Nouv. dict. de méd. et de chir. pratiq.*, vol. xxxiii, p. 211.

5. MAGNUS. The blind in the Breslau institution for the instruction of the blind. *Bresl. aerztl. Zeitschr.*, 1882, No. 19.

6. MARTIN. Considérations sur la cause la plus fréquente de cécité chez les agriculteurs. *Rev. d' ophth. du sud-ouest*, vol. iii, p. 204.

7. Ophthalmia in the expeditionary force of Egypt. *Med. Times*, Oct. 14, 1882, p. 447.

8. REICH. Report on ophthalmology in the military districts of the Caucasus for 1881 and 1882. *Militär-Med. Jour.*, Nov. and Dec., 1882.

9. v. ROTHMUND. On instruction in ophthalmology. *Mittheil. aus der Königl. Univ. Augenklinik zu München*, vol. i. Munich and Leipsic, 1882, vol. vi, p. 270.

10. v. ROTHMUND and EVERSBUSCH. Equipment of the clinic, hygienic conditions, clinical statistics, cases, etc. *The same*, p. 282.

11. SCHÜRMANN. The hygiene of the eyes. Published after the author's death by Dr. Eversbusch. *Mittheil. aus der Königl. Univ. Augenklinik zu München*, vol. i.

12. STEFFAN. What can we do, the individual as well as the community and the State, to check the evil of blindness? *Report of the fourth congress of teachers of the blind*, at Frankfort-on-the-Main, 1882.

BAUDRY (1 and 2) recommends the methods of Herter, Javal, and Monoyer for the detection of simulated amblyopia. If a spectacle frame with rotating prisms be brought before the eyes, Monoyer's method may be varied by rotating the prisms and using his letters in the stereoscope. v. MITTELSTÄDT.

3. On Dec. 1, 1880, there were 22,677 blind persons in Prussia: the ratio was 8.3 to 10,000 inhabitants; of men, 8.4 to 10,000; of women, 8.2 to 10,000. In the various provinces the ratio varied between 6.6 (Berlin) and 10.5 (East Prussia). The number of blind persons has diminished 1.3% since 1871.

According to MAGNUS (5) the principal causes of blindness of the inmates of the Breslau institution were the following: blenorrhœa neonatorum, 34%: exanthemas, 18%; congenital amaurosis, 10%; cerebral atrophy of the optic nerve, 10%; sympathetic ophthalmia, 9%. The total number examined of persons blind in both eyes was 87—52 males, 35 females.

MARTIN (6) found that hypopyon keratitis is the cause of 67 % of all cases of blindness among the rustic population, in the city of only 8–10 %.

During the last campaign in Egypt (7) 60 men per day became affected with ophthalmia. Oculists should accompany an army during a campaign. FERGUSON.

ROTHMUND (9 and 10) reports as follows on the Munich ophthalmic clinic: Chloroform is used only for enucleations and exenterations of the orbit, and prolonged operations on the lids. The after-treatment of squint-operations consists in cold applications. After an iridectomy, the bandage is removed on the third; after extraction, on the third or fifth days respectively, but the patients are not allowed to get up until the fifth and seventh days, respectively. The rooms are darkened, and the patients wear a pair of blue goggles as long as they are in the hospital. Disinfected solutions of atropine, zinc, and eserine are used. Astringent applications are not employed. Pilocarpine is used to advantage in subretinal effusions. Luetic affections are treated with a combination of inunction and Bärensprung's method. In the last two years 6,499 patients were treated.

b.—STATISTICAL PAPERS.

1. S. M. BURNETT. Second biennial report from June 1, 1880 to March 31, 1882. 14 extractions, 2 losses.

2. DAVIDSON and LAWFORD. Statistical report of eye department. *St. Thomas Hosp. Rep.*, vol. xi, 1882.

3. DONDERS. Drie-en-twintigste jaarlijksch verslag betrekkelijk de verpleging en het onderwijs en het nederlandisch gasthis voor ooglijders.

4. HAAS. Statistics of 300 iridectomies performed in the ophthalmic clinic from 1870 to 1880. *Mittheil. aus der Königl. Univ. Augenklinik zu München*, vol. i.

5. JUST. Tenth report of the Zittau Ophthalmic Institute for 1880 and 1881. Zittau, 1882, 111 extractions according to Graefe, 15 according to Pagenstecher, 5,992 patients.

6. LUNDY. First biennial report of the Michigan Ophthalmic and Aural Hospital, Oct. 1, 1880 to Sept. 31, 1882. 2,083 eye patients; 300 operations: 7 extractions; 19 enucleations; 1 neurotomy; 12 iridectomies.

7. STEFFAN. Twentieth annual report of Dr. Steffan's Ophthalmic Institute, in Frankfort-on-the-Main, 1882.

8. STÖR. Summary of the eye-diseases treated by Dr. Stör in 1881. Ratisbon, 1882, 1,237 patients; 10 extractions, 8 with $V=1-\frac{1}{10}$, 2 with $V=\frac{1}{10}-\frac{1}{200}$.

In 1880, 2,647 new patients were treated in the St. Thomas Hospital: 46 extractions; 39 iridectomies; 34 enucleations; 4 sclerotomies. In 1881, 2,620 patients were treated: 51 extractions; 41 iridectomies; 36 enucleations. NETTLESHIP.

DONDERS (3) treated 2,300 new patients: 42 extractions according to v. Graefe; 73 iridectomies; 36 tenotomies; 10 sclerotomies.

In the Munich ophthalmic clinic (4) 300 iridectomies were performed on 257 persons, 43 of whom were operated on both eyes, 123 only on the left and 90 only on the right; 37 persons were operated on both eyes at the same time. If the first operation went smoothly, the second was done at once; but if there were any irregularities, the operation on the other eye was postponed. For optical purposes 35 iridectomies were performed for central corneal opacities, 68 for adherent leucoma, 6 for partial staphyloma, 26 for closure of the pupil, 1 for anterior polar cataract. As an antiphlogistic iridectomy was performed in 68 cases. For prophylactic purposes, either to protect the other eye against sympathetic ophthalmia or to preserve the shape of a blind eye, iridectomy was done in 22 cases. 56 iridectomies were performed for glaucoma.

The eye having been carefully cleansed, an application of a solution of boracic acid is made a few hours before the operation. During the operation the other eye is covered. Graefe's knife is only used when the anterior chamber is very shallow, the sclera hard and rigid, or the globe very soft. The point of entry always lies in the sclera, except when it is desired to obtain a small pupil, when it lies in the cornea; this was done in 27 cases. The straight lance-shaped knife is only used for an iridectomy outward, the narrow one for an iridectomy for optical purposes, the broad one in glaucoma. The incision is made in the line of a tangent, and the wound enlarged when the knife is withdrawn. The length of the wound of an optical iridectomy is 3–4 *mm.*; in glaucoma 6–7 *mm.* The iris is abscised with Wecker's scissors. Borated lint and salicylated cotton are used for bandaging. The

following complications occurred during the operation: in 5 cases, prolapse of vitreous; in 1, dislocation of the lens; in 18, profuse hemorrhage; in 12, after-hemorrhage. These hemorrhages are of importance for the prognosis (observed by the REV. in cases of general dyscrasia); in one case injury of the lens. The iris healed in the scleral wound in 12 cases. The iridectomies performed for antiphlogistic purposes were generally more successful than those for optical purposes. The best results were obtained in anterior polar and zonular cataracts and in simple corneal opacities. As for glaucoma, the chances for the restoration of sight by an iridectomy are most favorable when it is acute.

The subsequent treatment consisted in uninterrupted decumbence for the next three days, both eyes being carefully bandaged; they were not opened until the fourth day. On the fifth day the patients can get up. Only liquid food is given the first three days, on the fourth semi-liquid.

STEFFAN (7) treated 5,574 patients. 421 operations were performed: 41 operations on the lens and 25 extractions of senile cataract; 21 good results, 2 medium, 2 failures. 22 iridectomies; 8 of them for opitcal, 11 for antiphlogistic, purposes. 19 tenotomies.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

a.—GENERAL PATHOLOGY AND DIAGNOSIS.

1. ADAMS. On the value of uniocular diplopia as a symptom. *Trans. Ophth. Soc. Unit. Kingd.*, vol. ii, pp. 199–205.

2. BERGER. A peculiar form of connective tissue in the papilla and retina. *Klin. Monatsbl. f. Augenheilk.*, Aug. 1882.

3. CHARNLEY. Keratoscopy. *Roy. Ophth. Hosp. Rep.*, vol. x, 3, p. 344, Aug., 1882. Discussion of the theory; he proposes to call it "Cuignet's method." FIZGERALD.

4. EVERSBUSCH. Contributions to the development of the serous cysts of the iris. *Mittheil. aus der Königl. Univ. Augenklinik zu München*, vol. i.

5. FITZGERALD. On a case of remarkable deficiency of visual acuteness in a seaman. *Trans. Ophth. Soc. Unit. Kingd.*, vol. ii, p. 182.

6. GALEZOWSKI. De la valeur séméiologique des phénomènes visuels chez les cataractés. *Rec. d' ophth.*, Dec., 1882.

7. HILBERT. A peculiar anomaly of pigmentation of the fundus. Klin. *Monatsbl. f. Augenheilk.*, Aug. 1882. Black spots upon the papilla and black staphyloma posticum.

8. JAVAL. Seconde contribution à l' ophthalmométrie. *Ann. d' ocul.*, July and Aug. 1882.

9. LANDMANN. On the action of foreign bodies aseptically introduced into the eye. *Arch. f. Ophth.*, vol. xxviii, 2.

10. LEBER. Communication on the action of metallic foreign bodies in the interior of the eye. *Arch. f. Ophth.*, vol. xxviii, 2.

11. LOISEAU. Application á l' éxamen des hommes de guerre du procédé de détermination de la refraction dit kérato-scopie. *Ann. d'ocul.* Sept.-Oct., 1882.

12. MAYERHAUSEN. The etiology of hydrophthalmus. *Centralbl. f. prakt. Augenheilk.*, Aug., 1882.

13. PARINAUD. De l' exagération des reflexes pupillaires. *Soc. de biol.*, July 22, 1882. *Gaz. d' ophth.*, No. 9. *Compt. rend. hebd. de la soc. de biol.*, No. 28.

14. PARROT. Sur un phénomène pupillaire observée dans quelques états pathologiques de la première enfance. *Rev. de méd. de Paris*, Oct. 1882.

15. SCHIÖTZ. Om nogle optiske egenskabeo ved cornea. *Nord. Med. Arch.*, 1882, vol. xvi, No. 28.

16. SCHULTÉN. Experimentela och kliniska undersökningar beträffende hjärnskador och deras inflytande pa ögots cirkulationsförhallanden. Helsingfors, 1882.

17. TALKO. Injuries to the eye of conscripts and recruits. *Gaz. lekarska*, 1882, No. 27. Among 59 persons 31 had artificial traumatic cataract of the right eye.

18. ULRICH. The anatomical changes in chronic inflammations of the iris. *Arch. f. Ophth.*, vol. xxvii, 2.

BERGER (2) found bright, silvery strands, with fine longitudinal striation in the papilla and its neighborhood. They always lie near the inner surface of the retina. The retinal blood-vessels are normal; also vision. They were always found in one eye only. Perhaps they are the remnants of neuroretinitis in earliest childhood or intra-uterine existence.

EVERSBUSCH (4) adopts the theory of Wecker in explaining the development of the cysts of the periphery of the iris, according to which they are nothing but encysted aqueous humor. Cysts of

the iris due to the existence of an irido-corneal scar develop in a somewhat similar manner; anterior synechias are more or less liable to lead to the development of cysts in the anterior chamber.

FITZGERALD (5) examined a naval officer who had served twelve years, whose vision in the right eye was fingers at $3\frac{1}{2}$ ft., in the left $=\frac{6}{18}$. Color perception normal. NETTLESHIP.

GALEZOWSKI (6) discusses the visual disturbances observed in incipient cataract, such as mouches volantes, photophobia, seeing rainbow-colors, diplopia, diminution of sight, acquired myopia, and reduction of the power of accommodation. The myopia according to him is real and due to increased thickness and density of the lens. MARCKWORT.

According to JAVAL (8) the optical examination of the eyes is not more useful than the ophthalmoscopic, but can be resorted to more frequently. MARCKWORT.

LANDMANN (9) tries to prove Leber's opinion, that aseptic foreign bodies within the eye do not injure it, by analyzing the cases published.

LOISEAU (11) determines refraction, including astigmatism, by noting the shifting of light and shadow upon the retina, as seen when light is thrown into the eye with a concave mirror and the latter slightly rotated. MARCKWORT.

MAYERHAUSEN (12) saw hydrophthalmus develop during dentition under the symptoms of acute glaucoma. Eserine proved very efficient.

PARINAUD (13) noticed that in some cases the spinal myosis increased under the influence of light and convergence. The tendon-reflex is frequently more marked. V. MITTELSTÄDT.

PARROT (14) observed mydriasis during coma in fifteen cases of chronic infantile affections of the brain, as soon as he pinched the skin more severely. MARCKWORT.

SCHIÖTZ (15) shows that the colored rings of glaucoma are a phenomenon of diffraction. The surface of the cornea becomes opaque in consequence of the increasing tension, which when continued may even produce detachment of the epithelium. The diameter of the colored rings coincides with the micrometric measurements of the epithelial cells. OLE BULL.

SCHULTÉN (16) discusses the vascular system of the eye and brain and their relation to each other; the influence of cerebral

pressure and commotion of the brain on the circulation of the blood in the eye. He has examined the elasticity of the sclera, and found that it is quite considerable for low pressures, but soon diminishes and becomes very small under a pressure of 30–40 *mm.* Hg. The intra-ocular tension varies between 15 and 30 *mm.* After death the tension sinks, but becomes constant, at 10 *mm.* Hg, below which it does not fall, even when the eye is enucleated. When the intra-ocular tension is increased, the flow of blood into the blood-vessels of the retina and choroid becomes intermittent at a certain point, when the intra-ocular tension approaches the minimum of pressure in the ophthalmic artery; the flow of blood entirely stops when the intra-ocular tension exceeds the maximum of pressure in the artery. The pressure in this artery, which may thus be measured, is found to almost equal that in the larger blood-vessels. The quantity of blood and the intra-ocular tension depend upon: the lateral pressure in the blood-vessels of the eye, their tonus, their elasticity, the quantity of liquid in the eye, and the external pressure. When the intracranial pressure is increased, choked disc results. This condition develops even when the cranial pressure is comparatively low, and long before the dangerous symptoms on the part of the medulla manifest themselves, and is therefore of great importance for the diagnosis. Choked disc is observed especially when there is diffuse pressure due to effusions into the subdural and subarachnoidal spaces, but also in cases of local limitation of space within the cranium.

SCHIÖTZ.

ULRICH (18) found that when there was an increase of tension there was also always obliteration of the blood-vessels, hyaline degeneration of their walls, fibrous thickening of the iris, and enlargement of the small blood-vessels at the pupillary margin. Similar changes take place in those cases also in which there is no marked increase of tension.

b.—THERAPEUTICS.

1. CHIBRET. La manière la plus simple de pratiquer la sphinctérotomie et la pupille optique. *Arch. d' ophth.*, vol. ii, No. 6.

2. SNELL. On the use of the electro-magnet. *Brit. Med. Journ.*, Dec. 30, 1882.

3. STRISOWER. Marle bandage in operations on the eye. *Wratsch.*, No. 26. The paste-marle bandage remains immovable, and is therefore to be recommended for unruly patients.

In performing extraction, CHIBRET (1) introduces the pince-ciseaux closed, opens the branches as soon as their points project beyond the sphincter, and then closes them, at the same time pressing slightly against the iris, thus excising a triangular piece which is either removed at once with the instrument or later. He recommends this procedure for optical pupils also, as it is possible thus to control the size of the coloboma. v. MITTELSTÄDT.

SNELL (2) successfully made use of the electro-magnet in fourteen cases. In six the foreign body was removed from the lens and sight restored. In seven cases the foreign body was extracted from the vitreous. Twice the magnet failed.

FITZGERALD.

III.—INSTRUMENTS AND REMEDIES.

a.—INSTRUMENTS AND TECHNICAL CONTRIVANCES.

1. ALBERTOTTI. Telemetria. *Ann. d' ottalm.*, vol. xi, 5.

2. ALBERTOTTI. Experimental measurement of the inverted image. *Klin. Monatsbl. f. Augenheilk.*, p. 355. Illustrated description of an apparatus designed by him.

3. CHARNLEY. On keratoscopy. *Oph. Hosp. Rep.*, vol. x, p. 344.

4. CHARPENTIER. Sur quelques usages du trou sténopéique. *Arch. d' ophth.*, vol. ii, 3.

5. FUCHS. Proposal to construct an ophthalmoscope with a new device for reflection and polarization. *Zeitschr. f. Instrumentenkunde*, vol. ii, 9.

6. GALEZOWSKI. Ophthalmoscope à réfraction et à double foyer. *Rec. d' ophth.*, July, 1882; *Jour. de thérap.*, July, 1882; *Centralbl. f. prakt. Augenheilk.*, p. 247.

7. JULER. The theory and practice of retinoscopy in the diagnosis of errors of refraction. *Ophth. Rev.*, vol. i, 12.

8. MAYERHAUSEN. Test-numbers for determining the acuteness of vision according to Snellen's formula—$V=\frac{d}{D}$. Berlin, 1882.

9. MOYNE. Ottimetro modificato, *Boll. d' ocul.*, vol. v, 4.

10. WECKER and MASSELON. Astigmomètre. *Ann. d' ocul.*, July and Aug., 1882.

ALBERTOTTI (1) has attached the glass-plates of Helmholtz' ophthalmometer to the terrestrial telescope, as he has already

done to the ophthalmoscope and microscope, and expects to obtain good results with this combination, especially in regard to the quickness of telemetric determinations. DANTONE.

FUCHS (5) does away with the corneal reflex by means of a nicol, which also replaces the mirror, or simple glass-plate, respectively. The lens, which acts as a simple microscope, is so placed that it unites the rays emerging from the eye examined in the pupil of the observer.

The ophthalmoscope of GALEZOWSKI (6) is intended for examination both in the upright and inverted images. A smaller mirror of 8 *cm.* focal length, is placed in the centre of a larger concave mirror of 25 *cm.* focal length. The latter is intended for examination in the inverted, the former in the upright, image. The glasses for determining refraction are inserted into a rotating disc. MARCKWORT.

MAYERHAUSEN (8) claims for his plates the following advantages: 1, They are constructed on the same principle as the Latin test-types; 2, the numbers are more readily recognized than the complicated gothic letters; 3, many persons who cannot read are familiar with numbers; 4, they are adapted for the examination of children under school-age, who frequently know numbers but no letters.

MOYNE (9) has constructed an optometer without a tube, by placing in one of the foci of a double convex lens the eye to be examined, in the other a reduced plate of types. If, in order to be seen distinctly, the latter must be approached, there is myopia; if it must be removed beyond the focus, hypermetropia. The lens is chosen so that an approach or removal of 4 *mm.* corresponds to an error of refraction of 1 D. DANTONE.

WECKER and MASSELON (10) have constructed a very simple instrument for determining corneal astigmatism. The white frame of a black square, with a small hole in its centre for the eye of the observer, is held at some distance from the eye to be examined; this frame forms a square image upon a non-astigmatic cornea, while, upon an astigmatic cornea, it takes the shape of an irregular quadrangle or of a rectangle; the latter is the case where one side of the frame is parallel to the one at the principal meridians, which may easily be accomplished by revolving the square. Thus, one of the axes is found; the degree of astigmatism may approximately be determined from the shape of the rectangle,

which is compared with ten different quadrangles accompanying the apparatus. The first of these is square; in the succeeding ones, the length of two of the parallel sides diminishes, while that of the two others increase. (Comparison seems to show that Placido's keratoscope is more practical than Wecker-Masselon's astigmatometer, as the eye more readily observes a deviation from the form of a circle than of a square. Both Placido's circular and Wecker-Masselon's square disc can be easily constructed.—REV.) MARCKWORT.

b.—REMEDIES.

1. CASAGEMAS. Antisepsis in Dr. Barraquer's clinic. *Gaceta medica Catalana*, No. 35, June, 1882.

2. DEHENNE. De l' action de la pilocarpine dans les affections oculaires. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 10.

3. DEMAN. De la pilocarpine, son action dans la thérapeutique oculaire. *Thèse de Paris*, Aug., 1882.

4. ELLABY. Action de la strychnine et du courant constant sur l' œil normal. *Arch. d' ophth.*, vol. ii, No. 6. Strychnine and the constant current (the negative pole on the temple, the positive on the eye, six elements) increase the extent of the field of vision, especially inward in the horizontal meridian. The maximum is not obtained until after several applications. The increase and return to the normal is more rapid for red and green than for white and blue. v. MITTELSTÄDT.

5. FRONMÜLLER. Neutralizing the action of pilocarpine with homatropine. *Memorabilien*, vol. ii, 5.

6. GUTIEREZ. Ensago sobre la accion fisiológica y terapeutica del jaborandi. *Dissert.*, Guatemala.

7. HÖGYES. The action of some chemical substances upon the associated movements of the eyes. Investigated by Kovács and Kertész. *Arch. f. experim. Pathol.*, vol. xvi, 1 and 2.

8. LANDESBERG. Accidents from the use of jaborandi and pilocarpine in diseases of the eye. *Phila. Med. Times*, July 29, 1882.

9. MASINI. La resorcina nelle malattie degli occhi. *Boll. d' ocul.*, vol. iv, No. 12, August, 1882. An antiseptic which does not irritate in conjunctivitis, affections of the lachrymal sac, hypopyon-keratitis (0.05. = 0.2. : 30.0). DANTONE.

10. MILLES. Atropine ointment. *Roy. Lond. Ophth. Hosp. Rep.*, vol. x, p. 387, Aug., 1882. Atropine ointment is much to be preferred to the solution. FITZGERALD.

11. MINOR. Duboisine for photophobia. *Virginia Med. Monthly*, Sept., 1882. Photophobia in keratitis disappeared very rapidly when duboisine was used, but not after atropine. BURNETT.

12. PEÑA. El nitrato y chlorhidrato de pilocarpina. *Oftalm. prat.*, vol. i, No. 6; and Jequirity, *Oftalm. prat.*, November.

13. PROUBINSKY. The use of antiseptic solutions of atropine and eserine. *Vratchebnia Vedomosti*, 1882, No. 20. They are made antiseptic by adding one or two drops of an alcoholic solution of phenic acid (50 %).

14. REINHARD. The pressure in the anterior chamber and loss of corneal substance under atropine and eserine. *Inaug. Diss.*, Basel, 1882.

15. SNELL. Hyoscine. *Ophth. Rev.*, vol. i, Oct., 1882. More energetic mydriatic than atropine. FITZGERALD.

16. SNELL. Antiseptic solution of atropine. *Ophth. Rev.*, vol. i, Oct., 1882. Irritates less.

CASAGEMAS (1) describes the antiseptic method of Barraquer, who uses a 4 % solution of boracic acid for washing and disinfecting the instruments, the field of operation, and the operator; for disinfecting the wound, an 8 % (?) solution is used. Borated lint, salicylated cotton, and rollers of phenol-gauze are used for bandaging. Phenol is only used when there is considerable conjunctival secretion; otherwise always a solution of boracic acid.

According to the investigations of HÖGYES (7), the bilateral equilibrium of both eyes is disturbed when considerable quantities of the following substances are introduced into the circulation: chloroform, ether, morphine, codeine, picrotoxine. In the course of asphyxia there are also disturbances of the movements of the eye. Involuntary associated deviations and nystagmic oscillations set in, which are very peculiar in poisoning with chloroform, ether, and probably, also, codeine, and in asphyxia; while in poisoning with morphine and picrotoxine, there are slight twitchings of the globes, whose direction cannot be determined.

Under chloroform vertical nystagmus first sets in, or without it convergent bilateral strabismus, which slowly changes to divergent strabismus, until finally the primary position is again attained.

These movements are repeated several times during the narcosis. Under ether inferior lateral deviation, with lateral rotation, develops either with or without vertical nystagmus, from which position the eyes slowly return to the primary one. Under codeine horizontal bilateral nystagmus develops.

REINHARD (14) finds that atropine acts directly as a regenerator in corneal affections, while eserine, although it diminishes the tension in the anterior chamber, directly hinders regeneration. Eserine should only be used in marginal ulcers for producing more rapid vascularization, but must be stopped as soon as this is attained; when the ulcers are well vascularized, it is contra-indicated.

IV.—ANATOMY.

a.—GENERAL ANATOMY.

1. DURLACH. Observations on cases of malformation and checked growth of the eye. *Inaug. Diss.*, Bonn, 1882.

2. FARENECKY. Anatomy and physiology of cyclopia in man. St. Petersburg, 1882. General description based on the observation of ten cases.

3. GIACOMINI. Annotazioni sopra l' anatomia del negro. *Giorn. d. R. Acad. di Med. Torino*, 1882, Nos. 10 and 11.

4. MANDELSTAMM. A case of congenital microphthalmus. *Centralbl. f. pract. Augenheilk.*, October.

5. MONDIÈRE. Monographie de la femme Annamite, suivie de recherches sur les femmes Chinoises Min-Huöngs et Cambodgiennes. *Mém. de la soc. d' anthrop. de Paris*, vol. ii, 2 series, No. 4.

6. SCHAUMBERG. Cases of malformation of the eye. *Inaug. Diss.*, Marburg, 1882.

7. SZIKLAI. Congenital bilateral anophthalmia with subsequent development of the globes. *Wiener med. Wochenschr.*, No. 32.

Based on the observation of three cases of bilateral anophthalmia, unilateral microphthalmia, and bilateral microcornea DURLACH (1) discusses these malformations. In anophthalmia the globes are either entirely wanting or exist only in the shape of small round bodies. The adnexa however are there; the lids, for instance, are almost always well developed, though in a few cases there was no indication of them. The muscles are almost

always well developed, even when there is no trace of the globes. The lachrymal apparatus is generally to be found, though sometimes imperfectly developed. The optic nerve is generally missing, and frequently, also, there is a defect of certain portions of the brain. Generally there are other malformations besides anophthalmia.

Microphthalmia consists in more or less marked smallness of the globe and its adnexa. The margin of the cornea is frequently opaque, and colobomas of the iris are of very common occurrence. There may be no power of vision, or it may be more or less well developed. Generally both eyes are affected.

Cases of pure monophthalmia are rare. One eye may be normal, while the other is wanting or rudimentary. There is no marked boundary between microphthalmia and anophthalmia; frequently a close investigation reveals microphthalmia where a macroscopic examination seemed to show anophthalmia. Among the etiological factors must be placed syphilis of the father, consanguinity of the parents, heredity.

The author then adds a list of cases published since 1876.

Four years ago GIACOMINI (3) had discovered cartilage in the semilunar fold of two negroes. Since then he had an opportunity to examine six more bodies of negroes and found this peculiar formation in four of them; it was missing in the other two, who were, however, not of the pure negro race, but Egyptians. An examination of the semilunar fold of whites revealed this abnormity in only four instances,—three in 297 males, one in 251 females. Giacomini therefore believes that this cartilage is a peculiarity of the negro, similar to that of the Melanesians and Micronesians, whose semilunar fold is abnormally large in proportion to that of whites. (*Miklucho-Madag. Anthropologische Notizen*, 1876.)

DANTONE.

Besides other observations MONDIÈRE (5) measured the obliquity of the aperture of the lids in various Mongolian tribes. It is least among the Chinese. In men it is generally less than in women. It seems to be directly proportional to the degree of brachycephalia. v. MITTELSTÄDT.

SCHAUMBERG (6) describes various kinds of malformation; for instance: 1. Bilateral corectopia upward, observed in a young woman of twenty-three, and also in her younger brother; the refraction was M $\frac{1}{2}$; vision reduced, the field of vision somewhat

limited upward. 2. Unilateral corectopia. Irregular notches in the upper edge of the lens; the sphincter of the iris preserved; the pupil displaced upward and inward; vision reduced. 3. Coloboma of the choroid, observed in four cases. 4. Bilateral anophthalmus and cyst of the left lower lid. The adnexa of the eye are developed; the cyst is probably the result of degeneration of the globe. 5. Anophthalmus and microphthalmus. The rudiment of a globe has an elliptical shape, tension diminished; it is, therefore, probably the result of intra-uterine irido-cyclitis; the right orbit, containing the microphthalmus, is larger in all its dimensions than the left without a globe. 6. Microphthalmus and microcornea. 7. Bilateral microphthalmus with normal cornea; the father and grandfather likewise had congenital microphthalmus. 8. Bilateral microphthalmus combined with a linear, horizontal pupil. In this case the left eye was very obliquely placed, and its vision very poor. 9. Melanosis of the sclera. The lower outer quadrant of the left eye is of a dark violet color to a width of 6 *mm.*; a lighter shade of the same color extends at a distance of 2 *mm.* from the corneal margin entirely around the cornea. The pigment lies under the conjunctiva in the sclera. 10. Double-contoured nerve-fibres on the papilla, observed in five cases.

b.—LIDS, CONJUNCTIVA, CORNEA, LACHRYMAL APPARATUS.

1. HÖNE. Contributions to the histology of the cornea. *Med. Jahrbücher d. K. K. Gesellsch. d. Aerzte zu Wien*, 1882.

2. VON MISES. The nerves of the human lids. *Sitzungsber. d. K. Acad. d. Wissensch.*, Abth., iii, vol. lxxxv, 1882.

3. PREISS. Further contributions to the question of the permeability of the substance of the cells itself. 1. The relation of the corneal fibres (or lymph-ducts) to the corneal cells. 2. The circulation in the capillaries of the corneal margin is an intracellular current. *Virchow's Arch.*, vol. lxxxix, No. 1.

4. SASSE. The chemistry of Descemet's membrane. *Untersuch. a. d. phys. Inst. d. Univ. Heidelberg*, vol. ii, 4. Its chemical composition differs from that of the glutinous and elastic tissues, and the membrana propria of the cornea. The action of trypsine upon Descemet's membrane is more closely investigated.

HÖNE (1) has investigated the senile changes of the cornea. The offsets of the corneal cells are gradually converted into elastic

plates and films, while the nuclei seem to be changed into the same substance as the cells ; they can no longer be stained with advancing age.

VON MISES (2) reports as follows in regard to the innervation of the lids : The nerves entering the nasal and temporal ends of the lid form an intricate net-work occupying the region over the follicles of the lashes, and called the border plexus ; from this plexus branches go to the skin, muscles, lashes, and conjunctiva. Branches reach the conjunctiva with the small blood-vessels which enter the tarsus between the lobules of Meibom's glands, while others go to it in the region of the cul-de-sac. Most of these nerve-fibres lose their medulla when they enter the conjunctiva. The lashes also receive nerve-fibres from the border plexus ; they possess a nervous apparatus which marks them as organs of touch. The apparatus consists of a ring of nerve-fibres surrounding the follicle.

c.—VITREOUS AND LENS.

1. BECKER. The structure of the lens. *Ber. über d. xiv. Versamml. d. ophth. Gesellsch.*, Rostock, 1882, p. 174.

2. BERGER. Contributions to the anatomy of the zonula Zinnii. *Arch. f. Ophth.*, vol. xxviii, 2.

3. EVERSBUSCH. Clinico-anatomical contributions to the embryology and teratology of the vitreous. *Mittheil. aus der Kgl. Univ. Augenklinik zu München*, vol. 1.

4. HÄNSELL. The structure of the vitreous. *Ber. über. d. xiv. Versamml. d. ophth. Ges.*, Rostock, 1882, p. 109.

5. MAGNI. Considerazioni intorno alla formazione e costituzione definitiva del vitreo nell' occhio umano e intorno ai distacchi di jaloide esistenti nella sezione patologica della collezione anatomica della clinica oculistica di Bologna. *Rivista clinica*, 1882.

6. ROBINSKI. Investigations in regard to the so-called eye-lens fibres. *Arch. f. Augenheilk.*, vol. xi.

BERGER (2) comes to the following conclusions : 1. The pars ciliaris consists of cylindrical cells with supporting fibres between them, the latter apparently in connection with the hyaloid membrane covering the inner surface of the pars ciliaris retinæ. The supporting fibres and the elements of the supporting tissue in the retina are not digested in a solution of pepsine ; but this digests the cylindrical cells, the hyaloid membrane, and the inner ends of the supporting fibres connected with it. 2. The hyaloid membrane

of the pars cilliaris retinæ is the continuation of the internal limiting membrane ; it covers the posterior surface of the iris to the pupillary margin. 3. The zonula originates in the vitreous, with a small number of delicate fibres. 4. The zonula is in close apposition to the pars ciliaris retinæ in the ciliary ring and in the posterior part of the ciliary processes. In the middle portion the zonula is only connected with the ridges of the ciliary processes and the small elevations lying between them. In the anterior portion the zonula is only connected with the ridges of the ciliary processes. 5. Between the zonula, the ciliary body, and its processes little cavities are formed by the zonula stretching across the depressions between the ciliary processes and not adapting itself to the deeper parts of the ciliary body. These spaces communicate with the posterior chamber, but not with each other. 6. Fibres enter the zonula from the internal limiting membrane and its continuation, the hyaloid membrane of the pars ciliaris retinæ. The latter are generally somewhat longer. They extend inward and forward from behind and outward. Their entry into the zonula explains the increase in the number of fibres in the anterior part of the zonula. These fibres are either single or arranged in lamellæ. In the middle and anterior portions of the ciliary body they lie in the cavities formed by the zonula of the depressions between the ciliary processes. 7. The zonula is attached by means of delicate short fibres to the ciliary processes. They extend partly forward, partly backward, after entering the zonula ; the latter direction, however, is rather rare. 8. A few nuclei may be found in the zonula of young persons ; they are numerous in the new-born and the fœtus of six or seven months. In a fœtus six months old, fine capillaries were found in the zonula, though it could not be decided whether they belonged to the zonula or the vitreous. 9. The surface of the zonula bounding the posterior chamber is covered with delicate endothelium, which was observed in a human fœtus seven months old. It was also observed on the posterior surface of the iris and the parts of the posterior portion of the zonula not united with the ciliary body.

After discussing a case of peculiar checked growth in the vitreous EVERSBUSCH (3) describes the embryological development of the vitreous of various animals. His remarks may be summed up as follows : The blood-vessels springing from the hyaloid artery during intra-uterine life, and spreading through the vitreous, and the products derived from the mesoblast projecting into it, are not

primarily intended to furnish nutrition for the development of the vitreous itself, but of the retina, as far as supplying the latter with blood-vessels is concerned. They also seem to be of importance for the development of the the zonula Zinnii. On account of their connection with the capsulo-pupillary and pupillary membranes, they are important for the formation of the anterior portion of the uveal tract, as long as the permanent blood–vessels have not been developed. Not until all this has been accomplished does the organization of the vitreous begin. After the capsulo-pupillary membrane has entered into connection with the iris, the blood coming from the vitreous is discharged in two ways : 1. Through the blood-vessels of the iris. 2. Through the loops at the zonula into the central retinal vein. Later the communication between the iris and pupillary membrane becomes atrophic, probably due to the development of the blood-vessels of the iris; then the blood-vessels of the anterior capsule of the lens disappear, and as the loops at the zonula retract, the connection between the blood-vessels of the posterior capsule of the lens and the anterior surface of the retina is broken. The iris is thus first in obtaining an independent supply of blood-vessels, then comes the zonula Zinnii, and finally the retina and vitreous.

d.—RETINA.

1. W. C. AYRES. The chemical reaction of the visual purple. *Untersuch. aus dem physiol. Inst. d. Univ. Heidelberg*, vol. ii, 4.

2. CHITTENDEN. Contributions to the histo-chemistry of the visual epithelium. *Untersuch. aus dem physiol. Inst. d. Univ. Heidelberg*, vol. ii, 4.

3. DEUTSCHMANN. The effect of direct sunlight on the retina. *Arch. f. Ophth.*, vol. xxviii, 3.

4. HELFREICH. The venous pulse of the retina and intra-ocular circulation. *Arch. f. Ophth.*, vol. xxviii, 3.

5. KÜHNE. Observations on the anatomy and physiology of the retina. *Untersuch. aus dem physiol. Inst. d. Univ. Heidelberg*, vol. iv, 3.

According to AYRES (1) a solution of visual purple is discolored by adding a solution of trypsine, as the purple is decomposed. Visual purple contained in an undissolved state in the retina, however, is not affected by the trypsine solution, the color remaining unchanged.

DEUTSCHMANN (3) has found that direct sunlight produces changes in the retina similar to those of disseminate choroiditis. The retina is converted into a more or less structureless mass, the albumen being coagulated. Regeneration does not take place. The blood-vessels of the choroid in the region affected are widely distended, and small hemorrhages and little round nodules enclosed in spindle-cells are found.

According to HELFREICH (4) two kinds of pulsation may be observed on the disc and retina in insufficiency of the aorta: 1. The so-called capillary pulse at the entrance of the optic nerve, consisting in a rhythmic change of color of the papilla, reddening during the systole and paling during the diastole. 2. The pulse of the arteries of the optic nerve and the retina; it is characterized by a variation in the diameter of the blood-vessels, *i.e.*, the alternation between diastole and systole of the arteries, and an elongation and movement of the branches of the arteries.

KÜHNE (5) examined the eyes of an executed criminal immediately after the execution, and found that the color of the retinal rods was but slightly faded after using the eyes for several hours in moderate but sufficient light. There is no visual purple in the retina of several nocturnal animals, for instance, caprimulgus europæus and vespertilio serotinus.

e.—OPTIC NERVE AND BRAIN.

1. GANSER. The peripheral and central arrangement of the optic-nerve fibres and the corpus bigeminum anterius. *Arch. f. Psychiatrie*, vol. xiii, 2.

2. KNIES. The question of injecting the optic nerve. *Klin. Monatsbl. f. Augenheilk.*, Aug., 1882.

3. PFLÜGER. On injecting the optic nerve. *Ber. über die xiv. Versammlung d. ophth. Gesellsch.*, Rostock, 1882, p. 124.

4. VOSSIUS. A case of bilateral central scotoma and the pathological and anatomical condition. Contribution to the knowledge of the position of the fibres of the macula in the optic nerve, chiasm and optic tractus. *Arch. f. Ophth.*, vol. xxviii, 3.

GANSER (1) found that in the cat the uncrossed optic-nerve fibres extend in the chiasm and nerve along the lateral edge as a united fascicle, which also slightly covers the crossed fascicle on its dorsal surface; between the two an exceedingly small zone of mixed fibres may exist. The uncrossed fibres thus constitute a

real lateral fascicle in the cat. The uncrossed is smaller than the crossed fascicle.

KNIES (2) enters into a discussion with Kuhnt, who had denied the possibility of injecting the optic nerve. Knies shows that by exercising proper precaution they always succeed. PFLÜGER (3) confirms the results of Knies.

According to VOSSIUS (4) the fibres which supply the macula are situated in the tractus at the central edge and in the upper outer quadrant in two separate regions; in the chiasm they lie immediately beneath the surface of the optic recessus, remain there also more in the dorsal half, and occupy the centre in the intracranial portion of the optic nerve as far as the optic foramen; then they change their relative position and also the shape of the fascicle. While they previously resembled an oval, they assume the shape of a more upright oval near the orbit, an almost sickle-shaped figure, which immediately behind the optic foramen does not occupy the centre, but rather the temporal side. Then they remain on the temporal side, finally reach the temporal edge at the entrance of the central retinal blood-vessels, and continue to the papilla from this point in the lower outer sector of the cross-section of the optic nerve in shape of a wedge, whose base is formed by the surface of the optic nerve, the apex by the central blood-vessels.

f.—COMPARATIVE ANATOMY.

1. BERLIN. The normal fundus oc. of the horse. *Zeitschr. f. vergl. Augenheilk.*, 1882, No. 2. Excellent colored illustrations.

2. BERLIN. Ophthalmoscopic images. *Ber. über d. xiv. Versamml. d. ophth. Gesellsch.*, Rostock, 1882, p. 168. Fundus of the horse.

3. BORN. The nasal cavities and the nasal duct of the amniotic vertebrates. *Morph. Jahrb.*, vol. viii, 2.

4. BRUNS. Studies in comparative anatomy on the vascular system of the retina. *Zeitschr. f. vergl. Augenheilk.*, 1882, No. 2. He discusses: the horse, calf, sheep, pig, dog, cat, rabbit, guinea-pig, and rat. The proposed nomenclature of the retinal blood-vessels has already been described by Magnus in 1873.

5. EXNER. The function of the Cramptonian muscle. *Sitzungsber. d. K. Acad. d. Wissensch.*, 1882, vol. iii, p. 52. Aids accommodation; corresponds to the tensor chorioideæ of mammals.

6. HIRSCHBERG. The dioptrics and ophthalmoscopy of the eyes of fishes and amphibia. *Arch. f. Anat. u. Physiol.*, physiol. Abth., 1882, Nos. 5 and 6.

7. KÜHNE. Contributions to optochemistry. *Untersuchungen aus dem physiol. Inst. d. Univ. Heidelberg*, vol. iv, No. 3. On chromophane in the retina of birds.

8. LEGAL. The nasal cavities and the nasal duct of the amniotic vertebrates. *Morphol. Jahrb.*, vol. viii, p. 353.

9. PREUSSE. On the tapetum of the domestic mammals. *Arch. f. Thierheilk.*, vol. viii, p. 264, 1882.

10. PUFAHL. The eyes of birds. *Zeitschr. d. Verbandes d. ornithol. Vereine Pommern's u. Mecklenburg's*, Nos. 5–7.

11. TARTUFFERI. Le glandule di Moll studiate nelle palpebre dell' uomo e degli altri mammiferi e comparate alle tubolari cutanee. *Arch. per le scienze mediche*, vol. iv, 5.

12. VANDERKINDERE. Nouvelles recherches sur l' éthnologie de la Belgique. Enquête anthropologique sur la couleur des yeux et des cheveux. *Rev. d' anthrop.*, vol. v, 2d series, No. 3, 1882.

13. H. VIRCHOW. Contributions to the comparative anatomy of the eye. Essay for habilitation, Berlin, 1882.

14. ZELINKA. The nerves of the cornea of the teleosts and their ending in the epithelium. *Arch. f. microsc. Anat.*, vol. xxi.

HIRSCHBERG's (6) very interesting paper may be condensed as follows: The cornea of fishes, not being used in water, is no more developed than the reverse of the gable-statues of the old Greek sculptors. On the whole the cornea is flat in comparison with the length of the optical axis. In the eye of the pike, whose breadth of cornea equals that of man, but the length of whose optical axis is only one half that of man, the nasal part of the portion before the pupil is perceptibly more convex than the temporal portion. It would not be correct, however, to assume that in air also the cornea of fishes has no optical effect. In the eyes of such pikes it almost equals that of the human lens when set for the far-point. Just as the loss of the lens makes a normal human eye highly hypermetropic (H $\frac{1}{3}''$), the eyes of fishes become highly myopic when in air on account of the action of the cornea. The far-point lies 1–3″ in front of the fish-eye, according to the size of the latter. The degree of this myopia is about equalled by the refractive power of the cornea; it is probable therefore

that the fish-eye when under water is about emmetropic ; in reality it is slightly myopic. Viewed teleologically a low degree of myopia would seem quite practical, as even the clearest water is no longer transparent at greater distances. The optic-nerve fibres in the retina of various kinds of fishes are enveloped in a delicate sheath.

There is no power of accommodation in the eyes of frogs. Their lens is spherical and fills the globe almost entirely. There is no ciliary muscle. Probably the eyes of frogs are slightly myopic in air.

H. VIRCHOW (13) discusses various but connected questions in several chapters. In the first, he discusses the vitreous; it is intersected in various directions by membranes enclosing a serous liquid, which membranes can be best demonstrated in the embryos of the smooth adder. The second chapter refers to the vitreous of fishes, which is similar, though there is a great difference in its density in eyes that have been in alcohol, making a difference in composition probable. In the third, he contends that there is only one membrane between vitreous and retina, which may easily be demonstrated in embryos of the smooth adder ; but he will not decide whether this condition is general. This membrane possesses considerable firmness, has no structure, is absolutely transparent, and highly permeable for the liquid contained in the vitreous. In the fourth chapter he divides the cells of the vitreous into three kinds—round, stellate, and smooth. The last mentioned are supposed, by some authors, to lie near the surface ; others deny their existence, so that discussion on them cannot yet be considered closed. Of the stellate cells the author says nothing. The round cells are the ones generally referred to; they assume so many different shapes that they might be called variable cells. In the fifth chapter he speaks of the blood-vessels of the vitreous, in regard to which he recommends great caution, as they may develop wherever they are needed. The blood-vessels upon the surface of the vitreous, between it and the retina, belong to both, and sometimes serve the purpose of nutrition, sometimes of transudation. In the sixth chapter he treats of the development of the vitreous, in which transudation plays an important part. He owns that, morphologically, there is no difference between the vitreous cells of embryos of warm-blooded animals and roving cells, but does not believe that such a peculiar structure like the vitreous could develop only through general,

not local, influence. The seventh chapter, treating of the part played by the cells in the vitreous of adult animals, is mainly reflective and critical. The author admits, that as yet we know nothing of the influence of these cells. The last chapter treats of the eyes of seven species of fishes, and confines itself generally to the accommodative apparatus, and the "sickle-shaped" process. A comparative discussion on the veins of the choroid is important, though very short, as the investigations on which it is based are described in previous papers of the same author. The vorticose veins are only the separated halves of two veins,—a dorsal and ventral one. The blood-vessels of the choroid are arranged, not on a radiate, but on a bi-lateral, type—the arteries entering in the horizontal meridian and the veins passing out above and below. The sickle-shaped process really forms a part of the vitreous; it varies in shape, has its own system of blood-vessels, and may or may not be pigmented.

The campanula is spherical or smooth, and parallel, to the posterior surface of the iris. It varies considerably in size and shape; its fibres extend from one side to the other, rising a little on the nasal side. The lens is attached by means of one or two membranes to the ora serrata; they vary very much in various kinds of fishes, as well as in their structure. Virchow formulates no theory of action based on these anatomical conditions, leaving it to the reader to form his own conclusions.

V.—PHYSIOLOGY.

a.—GENERAL PHYSIOLOGY.

1. ALBERTOTTI. Experimental measurement of the inverted image. *Klin. Monatsbl. f. Augenheilk.*, 1882, p. 335.

2. v. FLEISCHL. Notes on physiological optics. *Sitzungsber. d. Kön'gl. Acad. d. Wissensch.*, vol. iii, June, 1882.

3. GENZMER. Investigations on the visual perception of the new-born. Halle, 1882.

4. DE HAAS. The commutation of light into excitation of vision. *Klin. Monatsbl. f. Augenheilk.*, July, 1882.

5. LANG and FITZGERALD. The movements of the eyelids in association with the movements of the eyes. *Trans. of the Ophth. Soc. of the Unit. Kingd.*, vol. ii, p. 217. *Lancet*, ii, 3.

6. MAGAARD. On the secretion of the lachrymal gland and its product. *Virchow's Arch.*, vol. lxxxix.

7. MAYERHAUSEN. On Maxwell's spot. *Arch. f. Ophth.*, vol. xxviii, 2.

8. PODNEW. The effect of sunlight on animals. *Ber. über d. Gesellsch. d. Aerzte zu Kasan*, 1882, Nos. 1–10.

9. SCHULTEN. The observation of the fundus under a high magnifying power. *Arch. f. Physiol.*, 1882, p. 285.

10. URBANTSCHITSCH. The influence of the external and the middle ear on the senses—especially sight. *Wiener med. Blätter*, No. 42.

Helmholtz explains the phenomenon (2) of a fine net, a rod, or a straight edge appearing wavy, by the anatomical condition of the retina or the cones of the yellow spot respectively. FLEISCHL does not accept this explanation, and asserts that a wavy impression is made upon the retina when the image passes over it with moderate velocity.

GENZMER (3) thus describes the development of sight in the new-born : the eyes are sensitive to light immediately after birth, and the pupils react promptly. When a strong light suddenly falls upon them they converge. A new-born child cannot follow an object with the eyes, but can fix upon it when in the line of vision. Perhaps this can be explained by an insufficient development of the optic tracts. The conclusion also follows that, at first, the child only has impressions of light and dark, which are mainly transmitted from the macula lutea. Convergence for the purpose of fixation was not observed until the fourth week. An energetic contraction of the ciliary muscle was observed with the ophthalmoscope in a child two weeks old, when convergence had been produced by strong light ; this shows that there must be a preformed connection between convergence and accommodation. Colors are not noticed the first few months ; white objects first attract the child's attention, no attention being paid to colored. The color sense begins to develop in the fourth month—red being recognized first, though white still takes precedence. It therefore follows that the new-born child is more affected by the quantity than the quality of light.

DE HAAS (4) thinks that the little discs of the outer part of the rods and cones are put into vibration by the ether-waves according to their thickness and coefficient of refraction.

MAYERHAUSEN (7) sees Maxwell's spot in shape of a six-pointed star, one point exactly directed upward and another down-

ward. The outer boundary gradually fades away; the inner is more clearly marked, and is formed by the bright and also stellate halo, which again encloses a dark, star-shaped figure. The latter resembles a four-pointed star whose points are divided. The same condition was observed in an albino.

PODNEW (8) reports as follows on the action of light: 1, it favors development; 2, strength diminishes more rapidly in the dark than in the light, when food is withheld; 3, light favors the repair of most tissues; 4, it increases the quantity of urine and carbonic acid; 5, it increases the pulse and respiration; 6, it increases the sensibility of the skin, and adds to the efficiency of the other senses also; 7, it favors the action of certain drugs—for instance, atropine.

URBANTSCHITSCH (10) has found that the perception of light is diminished by an affection of the ear; when the latter improves vision also improves. He thinks it is a reflex action of the fifth nerve.

b.—CORNEA, IRIS, AND REFRACTIVE MEDIA.

1. CASTALDI. Le arterie del tratto uveale anteriore e la genesi dell' acqueo. *Giorn. internaz. de scienze mediche*, vol. iv, Nos. 7 and 8.

2. DENISSENKO. The question of nourishment of the cornea. *Klin. Monatsbl. f. Augenheilk.*, Sept., 1882.

3. PFLÜGER. The question of nourishment of the cornea. *Klin. Monatsbl. f. Augenheilk.*, 1882, p. 372. Controversy with Denissenko.

4. SCHADOW. Contributions to the physiology of the movements of the iris. *Arch. f. Ophth.*, vol. xxviii, 3.

5. SCHULEK. The optical conditions in cases of double pupils. Defence of the formation of a pupil while leaving the sphincter uncut. *Arch. f. Ophth.*, vol. xxviii, 3.

According to CASTALDI (1) the aqueous humor is secreted by the ciliary processes during the contraction of the ciliary muscle; by the iris, on the contrary, when the pupil is wide. For this reason the muscular fibres of the walls of the arteries of the iris are longitudinally arranged, though at the ends they are of both kinds. In consequence the blood-pressure is only increased when the pupil is wide; the aqueous humor, which is then secreted, is conducted through lymphatic spaces to the pupillary margin, and is

there discharged into the anterior chamber. When the pupil contracts during accommodation the secretion from the iris ceases, so that the tension in the anterior chamber, already increased by the advancement of the lens may not be added to. The contraction of the sphincter of the iris is not synchronous with that of the ciliary muscle, but follows it, which would be meaningless if it were considered simply a manifestation of the act of accommodation. The author's experiments seem to show that the aqueous humor is principally discharged through the meshes situated in front of Schlemm's canal. The liquid enters the sub-conjunctival lymph-ducts a few millimetres from the corneal margin.

DANTONE.

DENISSENKO (2) enters into a controversy with Pflüger, and maintains: The cornea is nourished from the margin from the blood-vessels of the conjunctiva and sclera, toward the centre, and from in front backward. The lymph passes through Descemet's membrane and fills the anterior chamber. The upper and deeper layers are not nourished by any particular blood-vessels; the anterior chamber has nothing to do with the nourishment of the cornea. The theory that the aqueous humor nourishes the cornea is not new, as might be inferred from recent papers, it having been propounded by Stenonius more than two hundred years ago.

According to SCHADOW (4) the width of the pupil is not dependent upon the refraction. In youth (below 20) the pupil is at a maximum 2–3, at a minimum 1–1.5 *mm.* wider than at a more advanced age.

c.—RETINA AND CENTRAL ORGANS.

1. BECHTEREFF. The function of the olives in the medulla oblongata. *Wratsch*, Nos. 34 and 35.

2. CHARPENTIER. Recherches sur la distinction des points lumineux. *Arch. d' ophth.*, vol. ii, No. 4.

3. CHARPENTIER. Note complémentaire relative a l' influence de la surface sur la sensibilité lumineuse. *Arch. d' ophth.*, vol. ii, No. 6.

4. CHARPENTIER. Sur la durée de la perception lumineuse dans la vision directe et dans la vision indirecte. *Gaz. d' ophth.*, No. 9.

5. TUMIM. The physiological relations of the ganglion cervicale supremum to the iris and the arteries of the head. *Militär-med. Journ.*, Sept., 1882.

BECHTEREFF (1) found that severe mechanical injury of one olive in dogs produced constant nystagmus of both eyes, besides other compulsory movements. The eye on the injured side deviates downward and outward, the other eye upward and inward.
CHODIN.

CHARPENTIER (2) presented to the eye two and more points of light 0.2–1.6 *mm.* in diameter, and 0.1–2.5 *mm.* apart, at a distance of 20 *cm.*, and then noted the minimum quantity of light necessary to make them visible. It is inversely proportional to the size of each point, while the number of the points and their distance apart, as long as the latter does not exceed an angle of 35–40 ft., have no effect on the visibility. The results were somewhat different for the ordinary perception of light, where for a retinal surface of the same size or smaller than the fovea centralis the intensity of illumination may be the less the greater the illuminated surface or the sum of the several spots touched by the light.
V. MITTELSTÄDT.

The length of time necessary for the perception of light is very variable even for one and the same person ; only the average of a test is constant. It is shorter for central than for peripheric vision. Practice decreases the time in both cases. The effect of practising a peripheric point of the retina is perceptible over the entire half of that eye and of the other also. V. MITTELSTÄDT.

TUMIM (5) draws the following conclusions from his investigations : 1. The ganglion cervicale supremum exercises independently of the central organs not only a trophic but also a tonic influence upon the nerve fibres going to the iris. 2. The nerve connecting the ganglion with the hypoglossal nerve is not the conductor of reflex irritation from the cranio-spinal centre to the eye. The ganglion has no tonic influence on the nerve fibres issuing from it to the arteries of the head. HIRSCHMANN.

d.—COLOR-PERCEPTION.

1. AGLAVE. De l' audition des couleurs. *Rec. d' ophth.*, No. 9, Sept., 1882.

2. ENGELMANN. Color and assimilation. Bacterium photometricum. Contribution to the comparative physiology of light- and color-perception. The light- and color-perception of low organisms. *Arch. f. d. ges. Physiol.*, vol. xxix, p. 387.

3. GIRAUD-TEULON. Considérations sur les doctrines des

trois fibres fundamentales d' Young comme base d' une théorie des sensations colorées. *Acad. de méd. Gaz. méd. de Paris*, No. 44. Against Helmholtz.

4. KOLBE. A case of congenital unilateral weakness of red-green perception. *Centralbl. f. prakt. Augenheilk.*, Oct.

5. v. KRIES. The perceptions of the visual organ and their analysis. Leipsic, 1882. Too extensive to review ; to be highly recommended.

6. KROLL. The good results of educating the color sense. *Centralbl. f. prakt. Augenheilk.*, Dec., 1882.

7. MAYERHAUSEN. Contributions to the knowledge of erythropia. *Wiener med. Presse*, No. 42.

8. MAYERHAUSEN. On the association of sounds, especially words with colors. *Klin. Monatsbl. f. Augenheilk.*, p. 383. Criticism of the five cases thus far described and report of a sixth.

9. MAYERHAUSEN. On erythropobia. *Centralbl. f. prakt. Augenheilk.*, p. 348.

10. PAMORT. Du contraste chromatique. *Soc. de biol.*, July 23, 1882. Location central.

11. PARINAUD. Du contraste chromatique. Sa raison physiologique. *Soc. de biol.*, No. 28.

12. PEDRONO. De l' audition colorée. *Ann. d' ocul*, Nov–Dec. New case.

13. SCHNELLER. The question as to the centre of color-perception. *Arch. f. Ophth.*, vol. xxviii, 3. Critical review of the literature and report of a new case.

14. VAN DER WEIJDE. The systems of the color-blind. *Arch. f. Ophth.*, vol. xxviii, 2.

AGLAVE (1) believes there are connecting fibres between the centres of hearing and color-perception.

According to ENGELMANN (2) the movements of low organisms due to light may be produced in three entirely different ways : 1, directly by a change in the inspiration and expiration of the gases, uninfluenced by any sensation ; 2, by a change in the perception of the necessity of breathing, due to a change in the inspiration and expiration of the gases ; 3, by means of a specific process probably corresponding to our perception of light.

According to KROLL (6) 0.3 % of the men in Crefeld and its surroundings are red-green-blind, a fact which he explains by

their occupation, silk-weaving having been practised there for two hundred years, which had developed the color sense of the male population. By educating the color sense in the schools a similar result might be obtained for the population of the whole country; he therefore favors a plan looking to this in all the schools.

According to MAVERHAUSEN (7) erythropia sets in not only after the removal of cataractous lenses, but also when the pupil is dilated by mydriatics before extraction.

B.—ANOMALIES OF REFRACTION AND ACCOMMODATION, LIDS, LACHRYMAL APPARATUS, MUSCLES AND NERVES, ORBIT AND NEIGHBORING CAVITIES, CONJUNCTIVA, CORNEA, SCLERA, AND ANTERIOR CHAMBER.

BY DR. C. HORSTMANN.

I.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

1. DÜRR E. Tabular statement of the refractive condition of the scholars of a Hanoverian school. *Ber. über d. xiv. Vers. d. ophth. Ges.*, p. 166.

2. REICH, M. Myopia in the Trans-caucasian female seminary, the Tiflis military school, the "Zunker" school, and artificial illumination in the classes and dormitories. *Medicinsky Sbornik d. Kaukas. med. Ges.*, 1882, No. 34.

3. ELLINGER. The physiology of writing. A contribution to school-hygiene. *Graefe's Arch. f. Ophth.*, vol. xxviii, p. 233.

4. COHN, H. On white artificial slates for the prevention of myopia. *Centralbl. f. prakt. Augenheilk.*, 1882, p. 334.

5. CHIBRET. Détermination quantitative de la myopie par la keratoscopie a l' aide d' un simple miroir plan. *Ann. d' ocul.*, 1882, vol. lxxxviii, p. 238.

DÜRR (1) examined the refraction of all the scholars of Lyceum II, of Hanover, after a drop of homatropine had been instilled. In the lowest classes there was only 15 % of myopia, but it gradually increased to 94 % in the highest, the average of the whole school being 31.7 %. In the lowest classes 81 % of hypermetropia was found, which gradually diminished until in the highest class it had entirely disappeared.

REICH'S (2) results were as follows: In the lowest class of the school for girls there was 12 % of myopia; in the highest, 53 %, the average being 33 %. The development of myopia was due to the poor illumination in the lower classes. In the three classes of the infantry-school there were 52 myopes among 292 scholars. The ratio of the square surface of window to that of the floor was 1:12 and 1:16. The illumination at night was very poor. The majority of the myopes were Armenians. HIRSCHMANN.

ELLINGER (3) opposes the practice of inclining the copy-book to the right, as it favors the development of myopia.

COHN (4) recommends the introduction of slates of white stone instead of the customary ones, as the former produce no reflection, and black writing on a white background can be read at a greater distance than the reverse.

CHIBRET (5) determines myopia by the movement of the shadows of the retina, which takes place when light is thrown into the eye with a mirror and the latter rotated slightly.

MARCKWORT.

II.—LIDS AND SURROUNDINGS OF THE EYE.

1. TAMAMCHEFF. Another contribution to the pathology and treatment of affections of the margin of the lid, especially trichiasis and distichiasis. *Ber. über d. xiv. Vers. d. ophth. Ges.*, p. 178.

2. GALEZOWSKI. Chancre des paupières du globe oculaire. *Rec. d' ophth.*, Oct., 1882.

3. SNELL. Hard chancre of inner canthus. *The Lancet*, 1882, No. 25.

4. BLANCH, AGUILAR. Mélano-sarcome de la paupière. *Rec. d' ophth.*, Oct., 1882.

5. CHIPOT. Œdème malin des paupières. *Soc. de chir.* Séance de Janv., 1882.

6. WALDHAUER. L' opération du trichiasis. *Rev. génér. d' ophth.*, vol. i, p. 513.

7. CHODIN, A. W. On Watson-Junge's operation for entropium of the upper lid. *Sitzungs-protocoll d. Kiewschen ärztl. Ver.*, Nov., 1882.

8. CARRÉ. Ectropium cicatriciel de la paupière inferieure operation avec greffe dermoepidermique. *Gaz. d' ophth.*, No. 12, 1882.

9. KRÜKOW, A. Remark on blepharoplasty. *Medicinskoje Obosrenye*, 1882, No. 10.

10. TAYLOR. On the transplantation of skin *en masse* in the treatment of ectropium and other deformities of the eyelids. *Brit. Med. Journ.*, Oct. 7, 1882, p. 672.

11. BORTHEN-LYDER. Epicanthus. *Rec. d' ophth.*, Oct., 1882.

12. SNELL. The elastic ligature in some cases of symblepharon. *Ophth. Rev.*, Dec., 1882, p. 399.

13. BENSON. On the treatment of partial trichiasis by electrolysis. *Brit. Med. Journ.*, Dec. 16, 1882, p. 1203.

According to TAMAMCHEFF (1) purulent inflammation of the tarsal glands and their surroundings may produce trichiasis and distichiasis. These affections may also be due to the closure of some or all the glands of the lids. At the same time there is always chronic tarsitis. In order to remove this condition he makes a longitudinal incision at the edge of the tarsus, 4–6 *mm.* deep, and parallel to the orifices of the glands. Then he cauterizes the exposed portion of the lid with a sharp stick of nitrate of silver. After the lapse of 48 hours the eschar with the irregular lashes, falls off. There is never a relapse.

GALEZOWSKI (2) reports four cases of specific ulcer of the lids. SNELL (3) one in which the ulcer was situated at the inner canthus.

BLANCH (4) describes a tumor of the lids; excision. It proved to be a melano-sarcoma. MARCKWORT.

CHIPOT (5) cured malignant œdema of the lids by subcutaneous injection of iodine, iodine bandage, and suturing the lids. The sutures were applied in order to prevent entropium.

MARCKWORT.

BENSON (13) cured partial trichiasis by galvano-cautery. He introduces a needle at the positive pole into the follicle, while he applies the other pole to the outer canthus. He treated 120 cases with good results. FITZGERALD.

CHODIN (7) recommends Watson's method as modified by Junge and himself for entropium of the upper lid and trichiasis without marked curvature of the tarsus. The operation consists in pushing the lashes upward, after detaching them by an inter-marginal incision, and transplanting into this space a bridge of skin

detached from the tarsus but not abscised at its ends. This piece of skin may slough or be destroyed entirely (1 case in 7).

HIRSCHMANN.

CARRÉ (8) transplanted two flaps 18 *mm.* broad and 27 *mm.* long into the defect formed by detaching the scars produced by burn; they became attached. v. MITTELSTÄDT.

After reviewing the history of blepharoplasty KRÜKOW (9) describes a case in which he operated according to Wolfe's method with good results. He then recommends Mirault's method of operation for cicatricial ectropium, and cites 19 cases besides 4 of his own in which the result was favorable. The operation consists in detaching and then reducing the ectropionized lid, freshening the edges of both lids, and uniting them with sutures. The lids are not separated until a longer time has elapsed.

HIRSCHMANN.

TAYLOR (10) transplanted flaps without a pedicle in a number of cases. The first was a defect in the upper lid, due to too extensive excision of skin in an operation for ptosis. The second case was one of very extensive symblepharon.

BORTHEN-LYDER (11) describes two cases of epicanthus which were operated according to Ammon. MARCKWORT.

SNELL (12) states that in some cases of symblepharon he found the elastic ligature of service. He passes a needle armed with a fine elastic thread through the band uniting the lid to the globe, and ties the ligature firmly. In from two to four days the ligature cuts itself out. The method was not always successful.

FERGUSON.

III.—LACHRYMAL APPARATUS.

1. DEHENNE. Note sur la therapeutique des affections des voies lacrymales. *Rev. d' ocul. du sud-ouest*, vol. iii, p. 217.

2. CORNWALL. A case of obstruction of the inferior canaliculus of the eye by dacryoliths. *Amer. Med. Journ.*, July, 1882, p. 108.

3. DAMALIX. Des larmes de sang. *Arch. d' ophth.*, vol. ii, 5, p. 429.

DEHENNE (1) is opposed to the use of powerful substances in treating strictures of the nasal duct. He introduces Bowman's probe No. 2 a few times, and syringes the canal with ordinary water.

CORNWALL (2) observed a closure of the lower lachrymal duct by a dacryolith.

DAMALIX (3) has compiled some older observations of bloody tears and adds one by himself at Panas' clinic. In a nervous young woman suffering from hysteria bloody tears were discharged at the same time of day at which formerly there had been hemoptoë (though the author never saw this himself [REV.]. It seems to be a rare symptom of hysteria. v. MITTLESTÄDT.

IV.—MUSCLES AND NERVES.

1. HOCK. The significance of the oblique position of the head. *Wiener med. Presse*, 1882.

2. BOUCHAND. Nystagmus horizontal unilatéral. *Journ. des sciences de Lille*, Nov. 5, 1882.

HOCK (1) calls attention to the influence of an oblique position of the head on the development of strabismus.

BOUCHAND (2) reports two cases of unilateral horizontal nystagmus, in one of which the autopsy showed atrophy of the left abducens and oculomotor nerves. MARCKWORT.

1. WARNER. Ophthalmoplegia externa. *Brit. Med Journ.*, Oct. 25, 1882, p. 843.

2. SNELL. Hysterical ptosis. *Ophth. Rev.*, Dec. 1882, p. 404.

3. LUNDY. Important cases. *Rep. of the Mich. Free Eye and Ear Infirmary*, 1882.

WARNER (1) describes the case of a woman, æt. twenty-five, who was the subject of Graves' disease, and whose eyes were nearly immobile. This condition had existed for five months. Limitation of the movements was not equal in both eyes, and was greater in the horizontal than in the vertical direction. There were double ptosis and bilateral paresis of the seventh and fifth pairs of nerves. There was also well-marked tremor of the legs. No evidence of syphilis. Under treatment the goitre diminished and the general condition improved, but the ophthalmoplegia remained. The inequality of the paralysis in the two eyes seemed to support the idea of an independent nerve centre for the movements of each eye. FITZGERALD.

SNELL (2) observed a case of hysterical ptosis in a girl about twelve years old, who had been menstruating for six months rather freely. She made a good recovery. FERGUSON.

In treating a paralyzed internal rectus muscle, LUNDY (3) seizes the ocular conjunctiva over the insertion of the muscle, and rotates the eye in various directions, especially outward and inward, for about a minute. This must be repeated after two or three days. The treatment was successful beyond a doubt.

S. M. BURNETT.

1. BADAL. De l' élongation du nerf nasal externe contre les douleurs ciliaires. *Ann. d' ocul.*, 1882, vol. lxxxviii, p. 241.

2. BLUM. Arrachement du nerf sous-orbitaire pour une névralgie rebelle. *Soc. de chir.*, séance du 29 Nov. et 6 Dec., 1882, *Gaz. d' ophth.*, 1883, No. 1.

3. WEINBERG. Troubles oculaires d' origine nerveuse produits par causes extra-orbitaires. *Rec. d' ophth.*, Nov., 1882.

BADAL (1) stretched the infra-orbital nerve, and excised a portion of it in three patients with good results. The affections thus treated were neuralgia of the trigeminus, chronic cyclitis combined with phthisis of the globe, and pains in chronic glaucoma (amaurosis). In the first case the infra-orbital nerve had previously been stretched with moderate success; in the second, peritomy had failed; and in the third, a broad iridectomy had proved of no avail.

BLUM (2) hit upon this method by accident, as the supra-orbital nerve tore while being stretched, the indication being neuralgia lasting for fifteen years. v. MITTELSTÄDT.

WEINBERG (3) discusses the ophthalmic zone, and believes that the cause must be sought in an irritation of the nerves of the skin; by reflex action this produces dilatation of the blood-vessels of the eye. The entrance of small particles of diseased skin into the conjunctival sac and the cornea is sufficient to produce severe affections like keratitis, iritis, etc. (? !—REV.). MARCKWORT.

V.—ORBIT AND NEIGHBORING CAVITIES.

1. PANAS. Diagnostic des tumeurs de l' orbite. *Gaz. d' ophth.*, 1883, No. 3.

2. SCHWENDT. On orbital phlegmone and subsequent blindness. *Inaug. Diss.*, Basel, 1882.

3. SNELL. Orbital periostitis; exophthalmus; atrophy of optic disc. *Ophth. Rev.*, Dec., 1882, p, 402.

4. LEDIARD. Large ivory exostosis. *The Lancet*, No. 25.

5. GRIFFITH. Hydatid of orbit. *Brit. Med. Jour.*, Dec., 1882, p. 1295.

6. MULES. Hydatid tumor of orbit. *The Lancet*, No. 25.

7. SNELL. Fracture of orbital plate of superior maxillary bone. *Ophth. Rev.*, Dec., 1882, p. 401.

8. SNELL. Hemorrhage into orbit; exophthalmus; atrophy of disc. *Ophth. Rev.*, Dec., 1882, p. 402.

9. JONES. Fractures of orbit. *Brit. Med. Jour.*, Oct. 25, 1882, p. 844.

10. GLASCOTT. Traumatic aneurism of the orbit. *Brit. Med. Jour.*, Nov., 1882, p. 1042.

11. GLASCOTT. Spontaneous cure of arterio-venous aneurism of the orbit. *Brit. Med. Jour.*, Nov. 25, 1882.

12. LLOYD, W. A case of intra-orbital aneurism following fracture of the base of the skull and meningitis. *The Lancet*, Nov. 11, 1882, No. 19, p. 799.

13. GALLENGA. Contribuzione allo studio dei tumori vascolari dell' orbita. *Giorn. d. R. Acad. di Med. di Torino*, 1882, Nos. 5 and 6.

14. PRIDEAUX. Penetrating wound of the orbit involving the brain. *The Lancet*, Nov. 18, 1882, No. 20, p. 846.

15. THOMSON. On two cases of abscess of the antrum. *Dublin Med. Jour.*, July, 1882, p. 16.

16. BENSON. Sarcoma of right antrum with intense optic neuritis and proptosis. *Brit. Med. Jour.*, Dec. 2, 1882, p. 1082.

17. SNELL. Eyeball transfixed by a knife-blade. *Ophth. Rev.*, Dec., 1882, p. 399.

18. PARINAUD. Tetanus consécutif a une plaie pénétrante de la cavité orbitaire. *Gaz. méd. de Paris*, 1882, No. 50.

According to PANAS (1) the point to be considered in affections of the orbit is, whether the tumor originated in the orbit or in the neighboring cavities. If it sprang from the outer wall, its origin is in the orbit. Then it must be determined whether the wall or a part of the contents of the orbit have become involved. The kind, prognosis, and treatment of the tumor depend on the special and general symptoms. In doubtful cases, which are not rare, surgical treatment should not be resorted to.

v. MITTELSTÄDT.

SCHWENDT (2) reports a case of phlegmone or abscess of the orbit, which caused atrophy of both optic nerves.

SNELL (3) reports a case in which, after severe toothache, the patient's cheek became much swollen, and the eyeball protruded. An incision along the lower margin of the orbit gave exit to a quantity of pus. The globe subsequently went back to its place, but the nerve was much atrophied. V = perception of light. FERGUSON.

LEDIARD (4) observed a large ivory exostosis which sprang from the orbital wall.

GRIFFITH (5) and MULES (6) report cases of serous cysts which had been removed from the orbit. There had been great protrusion of the globe, with swelling of the optic papilla, and V was very much reduced. The globe subsequently returned to its place, and vision improved considerably. FITZGERALD.

SNELL (7) reports a case in which a fracture of the orbital plate of the superior maxillary bone was caused by a fall on the roadside. The line of fracture could be distinctly felt running vertically from the edge of the orbit to the infra-orbital fissure. He also reports a case of hemorrhage into the orbit following a blow over the eyebrow. There was exophthalmus, which slowly subsided; subsequently, optic atrophy; V reduced to perception of light. FERGUSON.

JONES (9) describes a case in which both eyelids were lacerated by the strap of a carding machine. Right eyeball was destroyed, and a piece of bone was protruding through the upper lid. Eyelids were stitched; remains of eyeball removed, and a piece of bone dissected out. The latter proved to be a portion of the orbital plate of the frontal bone, including the orbital notch, and measured 1½ inches. The man quite recovered. FITZGERALD.

GLASCOTT (10) observed a case of traumatic aneurism of the orbit producing exophthalmus. Patient derived great benefit from intermittent compression of the left carotid artery. The exophthalmus was reduced, and there was a cessation of whizzing in the head, and the infra-orbital bruit de souffle disappeared. He also (11) observed a case of aneurism of the orbit, which had existed for some time, which was cured spontaneously during añ attack of phlegmonous inflammation of the face and head. FITZGERALD.

LLOYD (12) observed a case of intra-orbital aneurism in a woman of twenty-nine, who had been thrown from a wagon and had sus-

tained a fracture of the base of the skull. Meningitis ensued, and in about six weeks the left eye began to become prominent and sight to fail. Ligation of the common carotid artery checked the growth of the aneurism for a time, but six months later, the eye being still prominent, it was removed on account of the pain ; V had been lost.

GALLENGA (13) describes a curious case of unilateral exophthalmus observed at Raymond's clinic. The disease had begun with a marked swelling of the lids of the left eye about six years ago without any assignable cause. A year later, the globe, whose tension had increased a little, became slightly prominent, which gradually increased until finally it became at times a perfect hernia of the globe, the plane of the aperture of the lids falling behind the equator of the eye. The eye generally protrudes and is turned downward and outward, but covered by the lid. Compression forces the globe back as upon a soft cushion ; this is still more the case when the patient lies on his back and the carotid is compressed. When the pressure ceases, the globe springs back beyond the margin of the lid and then gradually returns to its former position. This dislocation of the globe also easily takes place when the head is bent forward and the patient breathes out. V was gradually lost, and there is now atrophy of the optic nerve. The diagnosis of cavernous angioma was made on account of the slow development, the absence of pulsation, the presence of a faint blowing sound, and especially on account of the power to replace the dislocated globe. DANTONE.

According to an observation of PRIDEAUX (14), a child received a penetrating wound of the orbit which involved the brain. It died on the fourth day. There was an extensive abscess in the right anterior cerebral lobe. FERGUSON.

THOMSON (15) reports cases of abscess in Highmore's antrum. BENSON (16) describes a sarcoma commencing in the right antrum, which had produced intense optic neuritis and proptosis.

FITZGERALD.

SNELL (17) reports a case in which a knife-blade transfixed an eye from the outer angle of the orbit. The globe retained its appearance, but all vision was lost. FERGUSON.

PARINAUD (18) observed a case of injury produced by a splinter, which had entered the orbit in the region of the lachrymal gland, and was extracted half an hour later. Symble-

pharon with partial lagophthalmus developed at the point of injury. Two wekes later blepharospasm, contraction of the external rectus muscle, and trismus set in, while the eye inflamed. Convulsions and opisthotonus soon followed. The patient did not appear again; probably he died. v. MITTELSTÄDT.

1. Morbus Basedowii. *Brit. Med. Journ.*, Oct. 28, 1882; and *Centralbl. f. pract. Augenheilk.*, 1882, p. 564.

2. PRIBRAUX. Reconvalescence in a severe case of Graves' disease. *Wiener med. Presse*, 1882, No. 44; *Wiener med. Wochenschr.*, 1882, No. 44.

In a person twenty-five years old (1) suffering from Basedow's disease, both eyes were almost immovable, besides ptosis and paralysis of both fifth and seventh nerves. No syphilis. The goitre disappeared under treatment, but the ocular symptoms remained.

VI.—CONJUNCTIVA, CORNEA, SCLERA, ANTERIOR CHAMBER.

1. SATTLER, H. Further investigations on trachoma and remarks on the origin of blennorrhœa of the new-born and its treatment. *Ber. über d. xiv. Versamml., d. ophth. Gesellsch. zu Heidelberg*, 1882, p. 45.

2. LANDESBERG, M. Blennorrhœa of the new-born. *Med. Bull.*, 1882, vol. iii, No. 2.

3. VALK, F. A peculiar case of trachoma. *Med. Rec.*, Aug. 26, 1882.

4. STOCQUART. Cas d' auto-inoculation vaccinale ayant donné lieu a une ophthalmie diphthéro-purulente.

5. BADER. The treatment of gonorrhœal ophthalmia. *The Lancet*, Oct. 14, 1882, p. 345.

6. SIMI. Sulla ottalmia purulenta provocata come un mezzo terapeutico. *Boll. d' ocul.*, vol. v, 3, Nov., 1882.

7. MAFFIORETTI. Contribuzione alla cura dell' oftalmia purulenta e blennorragica. Roma, 1882.

8. SÉDAN. Au sujet de la cure possible de la conjonctivite granuleuse chronique par l' inoculation purulente. *Rev. a' ocul. du sud-ouest*, 1882, vol. iii, 9.

9. DIANOUX. De l' ophthalmie purulente provoquée comme moyen thérapeutique. *Le progr. méd.*, 1882, Nos. 41 and 43.

10. MOURA-BRAZIL. Traitement de la conjonctivite granuleuse aiguë et chronique par l' abrus precatorius, Jequirity. *Ann. d' ocul.*, Nov. and Dec., 1882.

11. MOYNE. L' oftalmia purulenta artificiale prodotta dal Jequirity. *Boll. d' ocul.*, vol. v, 3, Nov., 1882.

12. SIMI. Jequirity. *Boll. d' ocul*, vol. v, 4, Dec., 1882.

13. CORDOSA. Du Jequirity dans le traitement des granulations de la conjonctive. *Gaz. med. de Paris*, 1882, No. 51.

14. TERRIER. Rapport sur un travail de Mr. Cordosa. Du Jequirity contre les granulations conjonctivales. *Soc. de chirurgie.* séance du 13 Dec., 1882.

15. SNELL. Boracic acid. *Ophth. Rev.*, vol. i., Oct., 1882, p. 346.

16. FERGUSON. Boracic acid in purulent conjunctivitis. *Ophth. Rev.*, vol. i, Nov., 1882, p. 363.

17. KAZANZOW, J. The importance of iodoform in ocular affections. *Wratsch*, 1882, No. 42.

18. MANOLESCU, N. L' iodoforme dans la chirurgie oculaire. *Arch. d' ophth.*, vol. ii, No. 6.

19. SNELL. Iodoform. *Ophth. Rev.*, vol. i, Oct., 1882, p. 345.

20. LANDOLT. Lepus peroxyde d' hydrogène dans la thérapeutique oculaire. *Arch. d' ophth.*

21. BENSON. Lupus of the conjunctiva. *Brit. Med. Journ.*, Dec. 23, 1882, p. 1256.

22. FALCHI. Granuloma e tuberculosi della congiunctiva. *Gazz. d' ospitali*, No 95 ; *Ottalm.*, 1882.

23. SBORDONE. Un caso di ulcera congiunctivale sifilitica primitiva. *Il movimento medico-chirurgico*, vol. xiv, Nos. 3 and 4, 1882.

24. ROBINEAU. Quelques variétés de tumeurs malignes de la conjonctive. *Thèse de Paris*, 1882.

SATTLER (1) has repeated his already published investigations on the development of trachoma through the agency of micrococci with special reference to Koch's method of breeding them. The culture and inoculation were completely successful, so that these results corroborate the former ones in every respect. As regards the morphology of the micro-organisms, they never assume the shape of chains or form large zoöglœa masses, but are either in small groups, single or in pairs, though when fully developed the separate elements never come into immediate contact, but are always separated by a small interstice. One of the principal characteris-

tics is the extensive subdivision of the trachomanodule. The trachoma-micrococci were bred through several generations. Sattler inoculated the human conjunctiva with micrococci of the third generation, which were purely bred. An eruption of trachoma-granules followed, taking a mild chronic course. Only the micrococci of trachoma produce similar granules on the conjunctiva, while other micro-organisms introduced and rubbed into the conjunctival sac produced no changes.

Sattler also introduced lochial secretion into the eyes of an infant. After forty hours blennorrhœa developed. This proves by direct experiment that blennorrhœa is due to infection with lochial secretion, and that the conjunctival sac of the new-born is the best soil for breeding the micrococci of blennorrhœa, when in a mixture of various kinds of bacteria. Probably the micrococcus of blennorrhœa floats about in the air. It enters the vagina, there undergoes a sort of preliminary culture, and thus acquires the peculiar power of producing, under certain favorable conditions, a blennorrhoic inflammation in the male urethra and the conjunctiva. The most rational form of treatment would therefore seem to be the antiseptic.

Landesberg (2) discusses blennorrhœa of the new-born. It is an infectious disease, and is generally produced by the introduction of abnormal vaginal secretion into the eye. Therefore the vagina of every woman in a normal condition must be abnormal when the head of the child passes through it. The examining finger as well as the whole vagina must be carefully disinfected before each examination, especially when performed by the midwife. The strictest precaution must be taken that the mother does not infect the child.

Valk (3) saw a case of trachoma in which the granulations were confined to the upper lid. They were of a light flesh color, perfectly dry, without any blood-vessels, of cartilaginous hardness, and formed cubes of one cubic *mm.* firmly pressed against each other. They resisted every kind of treatment, and were finally pressed out with a sharp fixation-forceps. Burnett.

Fifty-six days after the development of a vaccine pustule on his own arm Stocquart (4) observed purulent conjunctivitis in the left eye, followed by false diphtheritic membranes on the conjunctiva. Cured by antiseptic treatment. Probably some of the vaccine had got into the eye, as with the exception of the arm and eye no other part of the body was affected. v. Mittelstädt.

In three cases of gonnorrhoic ophthalmia, BADER (5) obtained good results by the use of a salve consisting of one grain of red precipitate and one fifth of a grain of atropine, to an ounce of vaseline. FERGUSON.

SIMI (6) favors the inoculation of blennorrhoic pus in cases of pannus. In view of the excellent result frequently obtained, so powerful a remedy should not be simply discarded. The danger to the cornea from blennorrhœa seems the less to the author, the denser the pannus which protects the healthy parts of the cornea like a coat of mail at the height of the inflammation. If jequirity should meet expectations, he would of course prefer it, as the intensity of the inflammation could be regulated. DANTONE.

DIANOUX (9) reports two cases of granular pannus and one of total sclerosis of the cornea which were cured by the inoculation of blennorrhoic pus. In the latter case improvement was very moderate. Dianoux hopes to produce a milder form of blennorrhœa by inoculation with Neisser's cultivated micrococci, and believes that obstinate cases of trachoma with intact cornea could be cured by such an inoculation. V. MITTELSTÄDT.

MOURA-BRAZIL (10) experimented with jequirity on rabbits, and found that the method as employed in Brazil is too dangerous, as it produces suppuration which cannot be controlled. In order to mitigate its action and properly dose it, he experimented with several preparations, and finally decided on a greenish extract for man (0.2 : 10.0), which he brushed on the granulations. A yellow membrane formed, which was removed next day ; the granulations were then again brushed and the membrane again removed. This treatment was continued for 3–5 weeks, when the granulations had become much smaller or had entirely disappeared.

MARCKWORT.

MOYNE (11) was the first in Italy to make experiments with jequirity. For three days applications were made with an infusion of jequirity (32 pulverized beans to 1,000 grms. of water), to the eyes of three children suffering from trachoma, who had been treated for four months with nitrate of silver and tannine without much success. In one case there was considerable reaction ; the lids swelled, the cornea became slightly hazy, and on the fifth day purulent secretion set in. This state of affairs soon ended, and on the twentieth day all the symptoms as well as the trachoma had disappeared. In the other two children the inflam-

mation was much milder, nevertheless the granulations soon disappeared. In all three cases the cornea was not pannous.

DANTONE.

SIMI (12) tried jequirity, according to Wecker's method, in two cases of trachoma and pannus. Inflammation set in as expected, and culminated on the fourth day; on the twelfth day it came to an end. As regards the result, no change could be seen in one patient, one of whose eyes was staphylomatous and the other partly so, either in the trachoma, which had existed for four years, or in the pannus. In the other patient the granulations had become smaller, while the pannus had not perceptibly diminished, though the patient declared he could see better. DANTONE.

TERRIER (14) used jequirity in a case of trachoma; purulent conjunctivitis ensued; the granulations were not affected.

MARCKWORT.

SNELL (15) obtained good results with boracic acid in purulent, catarrhal, and some kinds of phlyctænular ophthalmia. According to the intensity of the inflammation he uses a stronger or weaker solution (10-25 grains to the ounce). FERGUSON.

FERGUSON (16) recommends boracic acid in acute catarrhal and purulent ophthalmia. He uses it thus: After carefully ectropionizing the lid, boracic acid, in the form of an impalpable powder, is dusted upon and then washed off. If the action is too severe he employs a solution. FERGUSON.

KAZANZOW (17) like Deutschmann, praises iodoform in purulent keratitis, but saw no benefit, and sometimes even harm, in catarrhal conjunctivitis, trachoma, phlyctænular conjunctivitis, and blennorrhœa. In two minutely-described cases of extraction complicated with loss of vitreous, healing progressed without reaction under the influence of iodoform in form of a powder, and serviceable sight was obtained. HIRSCHMANN.

MANOLESCU (18) has used iodoform for two years in form of a powder and salve in affections of the cornea, and as an antiseptic in various operations. In one case of gonorrhoic ophthalmia with a corneal ulcer he obtained a good result, also in complicated extraction. In a few cases iodoform checked an incipient sloughing of the cornea; once panophthalmitis resulted.

v. MITTELSTÄDT.

In one case of purulent conjunctivitis published by SNELL (19) iodoform failed, but proved beneficial in some cases of trachomatous pannus. FITZGERALD.

LANDOLT (20) reports in detail on the production of hydrogen dioxide, its physical and chemical properties, its physiological action and its importance as an antiseptic. It acts as such by setting free oxygen in a nascent state, directly destroying the bacteria, and mechanically disintegrating the pathological products and thus aiding their removal. He recommends it diluted with water, especially in purulent conjunctivitis, old corneal ulcers, and purulent affections of the lachrymal apparatus, in all of which he obtained good results. It produces no pain and has no injurious influence on the eye, provided the preparation be pure, for controlling which he gives the necessary reactions. v. MITTELSTÄDT.

BENSON (21) observed lupus of the conjunctiva in a young girl. FITZGERALD.

FALCHI (22) describes an extensive ulcer of the left lower lid of a child seven years old, which proved to be tuberculous when examined with the microscope. The author compares the clinical and anatomical condition with that of a neoplasm of connective tissue observed in another person, in which the tuberculous nodules were not clearly developed, so that it was set down as a simple granuloma. DANTONE.

1. LUCANUS, C. Contributions to the pathology and therapeutics of the serpent corneal ulcer. *Inaug. Dissert.*, Marburg, 1882.

2. SIMI. Il fuoco nelle malattie della cornea. *Boll. d' ocul.*, vol. v, No. 4, Dec. 4, 1882.

3. DELORD. Cautérisation ignee de la cornée. *Thèse de Montpellier*, 1882.

4. GUAITA. Da medicatura antisettica della cheratite ulcerosa. *Annal. di ottalm.*, vol. xi, 5.

5. WHITE, B. Peritomy in acute vascular keratitis. *Brit. Med. Journ.*, Nov. 4, 1882, p. 890.

6. CHIBRET. De l' emploi de la syndectomie dans la cure de la keratite pustuleuse a rechutes. *Rev. d'ocul. du sud-ouest*, vol. iii, No. 11, p. 235.

7. DAUDRIÉ. Sur un cas de kératite syphilitique. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 12, p. 295.

8. BULL, O. B. Forekommer keratites neuroparalytica hos Spedalske. *Norsk Magazin for Slegevidenskaben*, vol. xii, No. 10, pp. 740–755, Christiania, 1882.

9. LIPPMANN, BERLINER. Case of hypopyon-keratitis due to fungi. *Inaug. Diss.*, Berlin, 1882.

10. MAGNUS, H. A splinter of glass which had remained two years and three months in the cornea of the left eye. *Klin. Monatsbl. f. Augenheilk.*, vol. xx, p. 396.

11. FANO. Collyre au laudanum dans les hernies de l' iris consécutives aux perforations ulcéreuses de la cornée. *Journ. d' ocul*, No. 13, p. 183, July, 1882.

12. KLEIN. Staphyloma. *Eulenburg's Real-Encycl. f. d. ges. Heilk.*, vol. xiii, p. 46.

Based on his observations of serpent ulcer, LUCANUS (1) concludes that the glowing iron cannot check its progress either with certainty or even probability. It may even act injuriously, either directly by thinning the cornea too much and thereby tending to the development of a staphyloma, or indirectly, as the more efficient splitting (cross-incision) is then too late.

SIMI (2) believes hypopyon-keratitis to be due to parasites, and recommends the ferrum candens as one of the most efficient means of preventing its spread. In a case which he accurately describes, he used a steel pen brought to a white heat in a spirit-lamp and held in an ordinary wooden pen-holder. After burning it twice in six days, an extensive ulcer healed in ten days, which had occupied one fourth of the cornea. The irritation was not increased by the cauterizations. DANTONE.

GUAITA (4) treated fifty-two cases of corneal ulcers under strict antiseptic precautions and obtained very good results. He used the dry salicylic bandage (5 % gauze and 4 % cotton, and over it gutta-percha paper) under a spray of 6 % boracic acid. In a few cases carbolic acid and thymol were first used, but soon abandoned, as they produced too much irritation. In the crater-shaped ulcers the effect was rapid and sure ; somewhat slower in the circular ulcers. The serpent ulcer could also be controlled in its early stage by the antiseptic treatment alone ; when far advanced, Saemisch's incision was added. DANTONE.

WHITE (5) performed peritomy of the cornea combined with Saemisch's operation in a case of corneal ulcer in which all other means had failed. The result was very satisfactory as only a small leucoma remained a few months later.

FITZGERALD.

BULL (8) opposes in his paper the theory defended by Böckmann (*vide* his inaugural dissertation "Om den ved trigeminus-anæsthesier forekommende Hornhindelidelses Vasen op Aarsager"), according to which the corneal affections occurring in paralysis of the fifth nerve are not due to drying up and reactive inflammation. After demonstrating that Böckmann is hardly justified by his experiments in concluding that the so-called xerotic theory (Feuer) is the only correct one, he shows that theoretically it can be still less maintained. SCHIÖTZ.

LIPPMANN, BERLINER (9) reports a case of hypopyon-keratitis, due to fungi. A portion of the cornea became necrosed.

MAGNUS (10) extracted a bit of glass from the cornea of the left eye of a lady, which had been there for two years and three months without causing any marked irritation.

FANO (11) treats hernias of the iris due to corneal ulcers by dropping a few drops of tinct. opii crocata (one to one part of water) every day upon them. Atropine and the other general remedies are used at the same time. MARCKWORT.

1. UHTHOFF. Some pathological changes in scleritis, episcleritis, and vernal catarrh. *Ber. über d. xiv. Vers. d' ophth. Ges.*, p. 63.

In episcleritis UHTHOFF found the blood-vessels considerably enlarged, their immediate surroundings infiltrated with round cells, as also the subepithelial tissue of the conjunctiva, while in a few places there were exudations interspersed with numerous cells. The lymph-vessels were considerably distended, and in one place had formed a system of lacunæ. Sometimes they had no endothelium.

In vernal catarrh the proliferations of the limbus consist of a thick epithelial layer extending downward like a peg, as in cancer, though there was no stratification. Immediately beneath the epithelial layer there is a bright homogeneous zone, composed partly of spherical, partly of oblong homogeneous masses, probably coagulated albuminous liquid. The connective tissue of the conjunctiva was but slightly altered.

C.—IRIS AND UVEAL TRACT, GLAUCOMA, SYMPATHETIC OPHTHALMIA, REFRACTIVE MEDIA (LENS AND VITREOUS BODY), RETINA AND FUNCTIONAL DISTURBANCES, OPTIC NERVE, INJURIES, FOREIGN BODIES (PARASITES), OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

By Dr. A. NIEDEN.

I. *a.*—IRIS.

1. Benson. Very large iritic membrane. *Brit. Med. Journ.*, Dec. 2, 1882, p. 1054.

2. Fano. Iritis syphilitique à formes hémorrhagiques. *Journ d' ocul.*, Feb., 1882.

3. Masse, E. Pathogénie des kystes de l' iris. Leur production artificielle par des greffes de lambeaux de cornée sur la membrane irienne. *Acad. des scienc.*, Jan. 15, 1883.

4. Owen. Tumor of the iris. *Brit. Med. Journ.*, Dec. 9, 1882, p. 1156.

5. Rampoldi. Le injezioni ipodermiche di calomelano a proposito di un caso di irite sifilitica gommosa. *Ann. univers. di med.*, 1882, vol. cclxi.

6. Sturgis, F. R. Two cases of gummous iritis. *Sel. Quart. of Med. and Surg.*, No. 5.

7. Talko, J. Case of persistent pupillary membrane in both eyes. *Zeh. klin. Monatsbl. f. Augenheilk.*, vol. xx, p. 346.

8. Zehender. On peripheric prolapse of iris. *Sitzungsber. d. Heidelb-opthth. Ges.*, 1883, p. 110.

Benson (1) reports a case in which, after an extraction of a traumatic cataract, the iris was almost completely altered into a layer of dense-looking white fibrous tissue, a few shreds of iris remaining at the lower and outer side. Through two small openings the fundus could be seen, showing extensive choroiditis. V=fingers at 3′. Fitzgerald.

Sturgis (6) reports two cases of syphilitic affection, in one of which there were cyclitis and choroiditis, while in the other the choroid was not affected.

Rampoldi (5) recommends subcutaneous injections of calomel (0.10 a dose), which for years have been practised by Italian

physicians in all affections of the eye due to syphilis, as well as in obstinate cases of keratitis and iritis not of specific origin. The result is remarkable, and frequently perceptible after twenty-four to forty-eight hours. In a case reported, two injections, combined with the internal use of calomel, sufficed to check the course of the disease in the eye. The first injection Rampoldi gives at the temple, but warns against entering the needle very deeply, in order to prevent an abscess or periostitis; for the second the arm may be chosen. DANTONE.

MASSE (3) continued his experiments on rabbits for the artificial production of cysts of the iris. He introduced a small piece of cornea abscised with Beer's knife into the anterior chamber, where it attached itself to the iris and became opaque and vascular, the blood-vessels coming from the iris; genuine cysts with transparent walls then developed, which undoubtedly grew out of the corneal tissue transplanted upon the iris.

MARCKWORT.

OWEN (4) showed a case of a small pedunculated vascular tumor, about the size of a large pin-head, situated near the free border of the iris. It had increased very little during a period of six months. Nature uncertain. FITZGERALD.

ZEHENDER (8) discusses the peripheric prolapse of iris, which frequently produces dangerous inflammation at a very late period, and ascribes this to the severe traction of the ciliary body (Swanzy). In order to prevent this Zehender has practised a special method of incising the edges of the iris with great success. In the discussion which ensued, Arlt, Leber, and others referred this destructive process to mycotic infection, sometimes resulting in the rapid destruction of the eye.

TALKO (7) discusses a case of bilateral persistent pupillary membrane, which scarcely differs at all from similar cases.

I. *b.*—CHOROID AND CILIARY BODY.

1. FUCHS, E. Congenital anomaly in the choroid. *Arch. f. Augenheilk.*, vol. xii, p. 1; These ARCH., vol. xii, 1, p. 37.

2. HIRSCHBERG, J. Case of binocular metastatic cancer of the choroid. *Sitzungsber. d' Berl. med Ges.*, Nov. 9, 1882; *C. f. A.*, vol. vi, p. 376.

3. HIRSCHBERG, J, The prognosis of sarcoma of the choroid. *Virchow's Arch.*, xc, pp. 1–75.

4. Hoene, J. Recherches microscopiques sur les ossifications chorioidiennes. *Rec. d' ophth.*, Dec., 1882.

5. Hosch (Basel). Un cas de tuberculose de la chorioide, inoculée dans la chambre antérieure de lapins. *Arch. d' ophth.*, vol. ii, No. 6.

6. Kazanzow, J. N. Case of sarcoma of the choroid. Read before the Society of Physicians of Jaroslav. *Wratsch*, 1882, No. 52.

Hosch (5) experimented upon the eyes of rabbits in regard to the inoculation of tuberculous masses of the choroid. He enucleated the right eye of a young man of seventeen without any hereditary taint, which gradually had lost its sight after previous nutritive disturbances, while a tumor gradually developed to the inward of the cornea, whose nature could not be definitely determined. From this tumor a fistula extended inward to a cavity occupying the greatest part of the interior of the eye, the walls of which consisted of a caseous mass, which included the deeper layers of the sclera and most of the choroid, while only the anterior and a small part of the temporal section of the eye was comparatively healthy. This caseous mass was introduced into the anterior chamber of three rabbits, where it produced an eruption of tubercles on the iris after the lapse of twenty-two to thirty-nine days. These tubercles when used for inoculation produced the same result after twenty-three days. Unfortunately the experiments could not be continued, as all the animals perished by an accident. In the inoculated tubercles neither giant-cells nor tubercle bacilli were found. Nothing abnormal in the thorax or abdomen. v. Mittelstädt.

Hoene (4) gives the microscopical description of two cases of bone-formation in the choroid. Hoene thinks that bone develops in the choroid in embryonic tissue, which is the product of exudation of the choroid. This exudation becomes organized, is changed to connective and finally to bony tissue. The precise localization, and the relation of the osseous tissue to the choroid, therefore, depend only on the intensity and localization of the inflammatory process. Marckwort.

Hirschberg (2) reports the second case of binocular metastatic sarcoma of the choroid and the first to be clinically observed. A woman of fifty-two had been suffering for nine years from a tumor of the mamma, and for three months from visual

disturbance of the right eye. V= $\frac{1}{7}$. At the papilla of the left eye there were a few round yellowish spots, in the right a flat bright thickening of the choroid which raised the retina. The same condition gradually developed in the left eye, while a central scotoma increased in extent. The neoplasms grew rapidly and extended to the upper edge of the optic disc. A myopia of 0.5 D was changed to hypermetropia of 2.5 D. In the right eye detachment of the retina was beginning in the lower portion.

In regard to the prognosis of sarcoma of the choroid, the same author (3) gives an interesting compilation of the thirteen cases which he observed (0.05 % therefore in 21,440). Only two were under forty, one twenty-two, the other thirty-four, the remainder between forty and sixty or over. Death ensued in five cases through metastatic affection of the liver, 1¾ years after the enucleation, without a sign of a local relapse, *i. e.*, in 38 % or 62 % respectively, as five of the cases could not be included on account of the brief time for observation. In one fourth of all cases enucleation may be considered a radical operation. A local relapse occurred but once; in two thirds of all the cases death ensued; two have shown no further symptoms for ten and five years respectively. Statistics of thirteen cases, which have partly been reported elsewhere.

KAZANZOW'S (6) patient, twenty-nine years old, when first examined presented the symptoms of chronic absolute glaucoma and cataract; she states that only a month ago she noticed that the eye was blind. Eight months later a large tumor had developed, which extended far beyond the orbit, and was grown together with the lids; the patient was in very poor health. Kazanzow did not venture to operate. He advises to enucleate the eye at once in every case of absolute glaucoma in which an intraocular tumor cannot be excluded with certainty.

HIRSCHMANN.

FUCHS (1) describes a case in which he found a large round spot about 4–5 times the diameter of the disc, presenting a light-yellow configuration on a black background; in outline it resembled the arbor vitæ cerebelli. There was no scotoma corresponding to this spot. Probably this anomaly was congenital, and may be classed with the colobomas of the macula lutea.

II.—GLAUCOMA.

1. ABADIE. Des indications de l' iridectomie et de la sclérotomie dans le glaucome. *Bull. gén. de thérap.*, 1882, p. 391.

2. GROSSMANN. Operation for glaucoma. *Ophth. Rev.*, 1, Oct., 1882, p. 332.

3. KNAPP, H. Traumatic loss of the anterior chamber; myopia; anterior chamber restored; acute glaucoma cured with eserine. These ARCH., vol. x, p. 451; *Arch. f. Augenheilk.*, vol. xii, p. 85.

4. KNIGHT. Two cases of increased eyeball tension, one reduced by eserine, the other by atropine. *The Lancet*, No. 11, 1882, p. 804.

5. PARENT. Pathogénie du glaucome primitif. *Rec. d' ophth.*, Dec., 1882. History of the theories of glaucoma.

6. RAMPOLDI. Un notevole caso di glaucoma preceduto da neurite ottico. *Ann. di ottalm.*, vol. xi, 5.

7. TARTUFERI. Sull' anatomia patologica della cornea nel glaucoma. *Giorn. di R. Acad. di med. di Torino*, No. 5–6, 1882.

TARTUFERI (7) has made a microscopical examination of all the corneæ of a collection of glaucomatous eyes, and in most of them found important changes. 1. The epithelium may be pushed apart by liquid between its layers, or cast off, the individual cells losing their form and structure and changing their position; the intercellular spaces are always enlarged. 2. Various finely granular lines become visible in Bowman's membrane; it may be disrupted by an infiltration with wandering cells or in some parts entirely destroyed. The diameter of the cornea may appear shortened by the interposition of connective tissue between the epithelium and the membrane in the periphery of the cornea. 3. The corneal tissue itself frequently becomes infiltrated with wandering cells, which are easily organized into connective tissue, especially in the periphery, while little drops of coagulated albumen are deposited between the fibrillæ and sometimes penetrate into Bowman's membrane. 4. In Descemet's membrane the longitudinal striæ are always more marked; the entrance of wandering cells or adhesion of the iris may produce a break in the continuity. 5. The epithelium is often loosened by drops of liquid, or separated from Descemet's membrane by connective tissue or fibrinous masses. The connective tissue contains more or less pigment. DANTONE.

In a young man of twenty-nine, who had received a blow on the right eye with a stick, KNAPP (3) observed emptiness of the anterior chamber, reduced tension, and myopia 5.50 D. A few

days after the anterior chamber had been restored an acute attack of glaucoma developed, while V was reduced to $\frac{1}{10}$. Energetic treatment with eserine and morphine alone overcame the attack, restored V, and removed the myopia. Probably a rupture of the globe had taken place at the sclero-corneal margin, and the glaucomatous attack may be explained by a change in position of Fontana's space, as is the case when old corneal fistulas are closed.

In a case of chronic glaucoma with greatly increased tension KNIGHT (4) obtained an immediate effect with eserine, while in another case of glaucoma after recurrent iritis atropine produced the same result. The author emphasizes the fact that increased tension does not always attend glaucoma. FERGUSON.

RAMPOLDI (6) observed a peculiar attack of glaucoma. A woman of forty-nine had lost the right eye from glaucoma and then became affected in the left with all the symptoms of acute glaucoma (megrim, supra-orbital pain, episcleral injection, slight haziness, and diminished sensibility of the cornea, dilated pupil, shallow anterior chamber, etc.); the intra-ocular tension, however, was not increased and sometimes even seemed below the normal. Examination with the ophthalmoscope revealed no excavation but marked injection of the disc, while the veins were swollen and tortuous, but neither pulsated nor were they bent. After treating her for ten days with salicylate of physostigmine these symptoms disappeared and V improved, but strange to say T increased. A month later the attack was repeated; a broad iridectomy checked it, but ten days later, after severe mental excitement, a third attack set in, when the eye became almost totally blind in spite of a sclerotomy. DANTONE.

GROSSMANN (2) suggests a new operation for glaucoma, the object of which is to open up the iris angle to a greater extent than can be attained by an iridectomy or sclerotomy. He makes a puncture with a stop paracentesis needle about two *mm.* from the limbus corneæ, and then introduces a dull-pointed probe bent into the form of a hook. He pushes the convexity of this hook gently but firmly between the cornea and iris as far and in as large a circumference as possible. He gently presses the peripheral part of the iris back toward the lens; this is repeated a few times, and if necessary he then turns the convexity round to another quadrant. He records three cases. FITZGERALD.

III.—SYMPATHETIC OPHTHALMIA.

1. EATON, F. B. Prophylactic measures against sympathetic ophthalmia in cases of injury; with report of a curious case of a foreign body in the eye. *Trans. Oregon State Med. Soc.*, 1882.

2. WILD, J. H. Three unusual cases of sympathetic ophthalmia. *Inaug. Dissert.*, Basel, Nov., 1882.

In EATON'S (1) case the foreign body, a piece of steel, penetrated the inner lower quadrant of the cornea and the lens, and embedded itself in the outer portion of the retina. There was some reaction, and the lens became cataractous, but this reaction ceased, and four months later the other eye was still normal. BURNETT.

Wild (2) reports the clinical history of three cases, in which (1) a foreign body had entered the eye and caused uveitis. Seven weeks later choroiditis and papillitis of the other eye. The ciliary body of the enucleated eye, which had undergone extensive changes, was found to be enormously swollen and infiltrated with pus. (2) As a result of gonnorrhoic conjunctivitis: necrosis of the cornea, cicatricial contraction of the iris and ciliary body. Eight weeks later apparently myopia of the other eye, tenderness in the ciliary region, and severe iridocyclitis. (3) Injury, iris healed into the corneal wound, producing chronic traction of the ciliary body, and plastic iridocyclitis. Five months later, sympathetic ophthalmia. The author adheres to the theory of migration.

IV.—LENS.

1. ANDREW, E. Dislocation of the lens. *Brit. Med. Journ.*, Dec. 30, 1882, p. 1292.

2. BENSON. Spontaneous dislocation of the lens into the anterior chamber. *Brit. Med. Journ.*, Dec. 2, 1882, p. 1055.

3. BENSON. Congenital cholesterine cataract. *Brit. Med. Journ*, Dec. 2, 1882, p. 1055.

4. CARRÉ. Cataracte sénile. Manuel opératoire de l' extraction. *Gaz. d' ophth.*, Nos. 1 and 2, 1883. Extraction downward with a flap 3 *mm.* high, which lies entirely in the cornea. Iridectomy.

5. DOR. Cataracte congénitale. *Lyon méd.*, No. 1, p. 17.

6. FERRIER. Sur la nécessité d' abandonner l' excision de l' iris dans l' opération de la cataracte. *Soc. de chir.*, séance du 27 Dec., 1882. Report on Galezowski's endeavor to re-introduce the old flap-extraction.

7. GALEZOWSKI discusses the same subject, based on a report of forty cases. *Gaz. des hôp.*

8. FÖRSTER On the ripeness of cataract, its artificial ripening, corelysis, and extraction of the anterior capsule. *Arch. f. Augenheilk.*, vol. xii, p. 3. These ARCH., vol. xi, p. 344.

9. FROTHINGHAM. Cases of hard cataract operated according to a modified Graefe method. *Phys. and Surg.*, July, 1882. In thirty-five cases thirty-one good results, two medium, one loss.

10. GALEZOWSKI. De l' étiologie de la cataracte. *Rec. d' ophth.*, Dec., 1882, and Jan., 1883.

11. HASNER. Three cases of ectopia and dislocation of the lens. *Prag. med. Wochenschr.*, vol. vii, No. 46, *Ver. Chron.*, p. 485.

12. LEBER. On cataract and other affections of the eyes in persons struck by lightning. *v. Graefe's Arch. f. Ophth.*, vol. xxviii, 3, p. 255.

13. MOYNE. L' operazione della cataratta nel grande ospedale di Venezia. *Boll. d' ocul.*, vol. v, No. 3, Nov., 1882.

14. MOYNE. Cataratta a forma congenita, verificata in tre fratelli. *Boll. d' ocul.*, vol. v, No. 3, Nov. 1882.

15. PANAS. Sur la cataracte nucléaire de l' enfance simulant la cataracte stratifiée ou zonulaire. Déductions opératoires, qui en découlent. *Arch. d' ophth.*, vol. ii, No. 6.

16. PASQUIN. Note sur un cas de cataracte capsulaire sénile. *Bull. méd. du nord.*, Jan., 1882.

17. PROUET. Trois observations de cataracte zonulaire. *Rev. d' ocul du sud-ouest*, vol. viii, 1882, p. 182.

18. SNELL. Lens dislocated into the vitreous becoming cataractous and undergoing absorption. *Ophth. Rev.*, Dec., p. 400.

19. TAYLOR. Eserine before extraction of cataract. *Brit. Med. Journ.*, Dec. 30, 1882, p. 1293. Recommends it.

20. DE WECKER. Quelques perfectionnements apportés a l' extraction de la cataracte. *Ann. d' ocul.*, Nov.–Dec., 1882.

GALEZOWSKI (10) discusses the cause of cataract and reports the case of a man of fifty-five, where he found the cause in an injury received ten years ago in the region of the ciliary body. He intended to extract the cataract; there was, however, a considerable loss of vitreous as soon as the knife had entered, so he modified the operation at once, and performed a division with the knife. No inflammation ensued, and the patient was discharged on the

fourth day. As the operation was performed Dec. 12, 1882, the final result was not yet known at the time of publication. The patient comes twice a week ; the cataract was beginning to break up, and a few flakes had fallen into the anterior chamber.

MARCKWORT.

LEBER (12) reports the case of a sea-captain of thirty-one, who had been struck by lightning, burning the skin of the left side of his body down to the thigh, and producing total hemiparesis of that side. After these affections had been cured, cataract developed in both eyes in the course of a few months, in the left more than in the right, while there was also partial atrophy of the optic nerve, mydriasis, and paralysis of accommodation of that eye. The result of the operation was comparatively good. Five similar cases of cataract were found in searching through the bibliography, eight cases of amaurosis in pre-ophthalmoscopic times, and periodic amaurosis or amblyopia respectively in four cases, among them the interesting one of Reich, of rupture of the choroid. Generally both eyes are affected, rarely (Saemisch) only one. The electric discharge is the cause of all these affections, no matter whether lightning strikes the body itself or only passes close to it. The direct physical, chemical, catalytic action of the electric discharge upon the lens is the cause of the cataract.

BENSON (3) reports a case of cholesterine-cataract in a child a year old, whose entire lens was a mass of bright yellow crystals.

FITZGERALD.

MOYNE (14) found congenital cataract in three children whose parents were not related. In the oldest it was zonular cataract, in the other two ordinary soft cataract. DANTONE.

PANAS (15) mentions three cases of hard nuclear cataract in children, which closely resembled zonular cataract and were extracted, as the opacity was so extensive that an optical iridectomy was out of the question. There never seems to have been rachitis. In the first case division was performed, when a hard nucleus fell into the anterior chamber and was extracted a few days later. Panas believes that this kind of cataract is more common than is generally believed. As it is very difficult to distinguish with certainty between the two kinds of cataract, Panas recommends extraction without an iridectomy in those cases in which an optical iridectomy or iridotomy cannot be performed.

V. MITTELSTÄDT.

In zonular cataract PROUET (17) performs an iridectomy, but leaves the sphincter, by making a peripheric incision 2 *mm.* long inside, then seizing the iris between the outer third and inner two thirds, drawing it out a little, and cutting it off as close to the forceps as possible. MARCKWORT.

ANDREW (1) is inclined to look more favorably upon the occurrence of dislocation of the lens into the vitreous, especially if the lens be still enclosed in its capsule. He reports two cases. In one of them the lens was only partially displaced, so he completed it by depressing it, and the result was very satisfactory. He suggests that in certain cases this old proceeding might be revived. FITZGERALD.

BENSON (2) reports the case of a boy who stated that five years previously, during an attack of panophthalmitis (?) in O D, a "scum" came on O S. The latter was not vascular. Cornea clear. Lens in anterior chamber quite white and opaque, and firmly fixed to posterior surface of cornea to a considerable extent. Lens capsule was ruptured with a needle, and the milky-fluid lens substance escaped, the capsule shrinking up. Slight milky appearance remained where lens had been adherent. V improved. Small patches of choroiditis, only abnormality in the fundus. B. suggests that when O D was attacked with panophthalmitis, there may have been a transient increase of tension in O S, sufficient to cause dislocation of lens but not enough to destroy the sight. FITZGERALD.

HASNER (11) showed three cases of dislocation of the lens: 1. congenital ectopia in both eyes, and dislocation of the right lens; 2. lens dislocated by an injury, producing sympathetic ophthalmia in the other eye; 3. the dislocation had been produced by a grain of shot penetrating into the eye, and was followed by irido-cyclitis.

SNELL (18) observed a case in which the lens was dislocated into the vitreous by a blow from a piece of steel. It subsequently became opaque, and as it floated to and fro in the vitreous its absorption was observed without difficulty. In about eighteen months it was completely absorbed, and V with $+ 3\frac{1}{2} = \frac{20}{10}$. FERGUSON.

FÖRSTER (8) first discusses the symptoms of ripeness of a cataract, by which is meant the possibility of removing the whole mass, so that no portion of the peripheric layers must remain

adherent to the capsule. Förster accelerates ripening in slowly developing cataracts by breaking up the anterior cortex by massage of the cornea after previously making an iridectomy. The effect on choroidal cataracts, however, is small. Posterior synechiæ may sometimes be detached in the same way. In order to remove a larger portion of the capsule when performing extraction, Förster seizes it with Liebreich's iris-forceps, and tears the anterior capsule. The results are very satisfactory.

WECKER (20) reports the results of 366 extractions performed during the last sixteen months: he did not have a single case of suppuration. He ascribes this good result to the strict observance of the following precautions: 1. Exact closure of the wound with a well-adapted conjunctival flap. 2. Disinfection of the wound with a spatula dipped into a 2½% solution of carbolic acid (no spray). 3. Careful excision of the iris, so that no part of it or the capsule in particular lies in the wound. After the operation Wecker examines once more with artificial light for remnants of capsule, closure of the wound, etc. MARCKWORT.

MOYNE (13) reports that in the ophthalmic division in charge of Fenoglio, of the great hospital at Venice, 500 patients are treated annually, ninety-five beds being at his disposal. To the end of September, 1882, forty-five extractions were performed. The percentage of loss has gradually been diminished from 13% to 3%. DANTONE.

V.—VITREOUS BODY.

1. NIEDEN. On recurrent idiopathic hemorrhage into the vitreous in young men. *Sitzungsber. d. ophth. Ges. zu Heidelberg*, 1882, vol. xiv, p. 8.

2. UNTERHARNSCHEIDT. A case of rupture of a persistent hyaloid artery due to progressive myopia. *Klin. Monatsbl. f. Augenheilk.*, vol. xx, p. 449.

NIEDEN (1) reports nine cases of idiopathic hemorrhage into the vitreous, affecting six young men between the ages of fifteen and twenty-four. It always occurred suddenly. There were no symptoms of dyscrasia; a direct cause could not be found. Absorption generally was equally rapid, though, as a rule, another attack soon followed. The peripheric equatorial portions of the retina or choroid respectively seemed to be the source of the hemorrhage. The macula always remained more or less intact. Almost all cases were cured; in one only a high degree of myopia remained.

These hemorrhages probably stand in close connection with the irritation of the blood-vessels due to the sexual development, as is the case with the epistaxis so frequently observed at this time of life. The sexual development of all the young men was retarded.

UNTERHARNSCHEIDT (2) found a thread as thick as a pin connecting the papilla with the posterior surface of the lens in a young myope ($M \frac{1}{7}$), apparently a remnant of the hyaloid artery. Three years later, the myopia having increased to $\frac{1}{4}$, this thread had parted and floated about in the vitreous. He explains this by the increased expansion of the globe, which was also proved by the increased size of the posterior staphyloma.

VI.—RETINA AND FUNCTIONAL DISTURBANCES.

1. AYRES, S. C. Retinitis albuminurica. *Columbia Med. Journ.*, Aug., 1882. Among 104 cases of albuminuria, retinitis was observed in nine of them, = 8.6 %

2. BERT. Observations sur le siège du scotome scintillant. *Compt. rend. hebd. des séanc. de la soc. de biol.*, vol. xxix, 1882.

3. BORTHEN, L. Amblyopia centralis nicotianica. *Norsk Magazin fer Lagevidenschaben*, vol. xii, No. 12, Christiania, 1882. Two cases observed in women.

4. DEUTSCHMANN. On blinding of the retina by direct sunlight. *v. Gräfe's Arch. f. Ophth.*, vol. xxviii, 3, p. 241.

5. FANO. Faculté chromatique dans l' amblyopie alcoholique et nicotinique. Valeur sémiologique du scotome central dans cette affection. *Journ. d' ocul.*, No. 114, p. 193, Aug., 1882.

6. FONTAN. De l' héméralopie tropicale. *Rec. d' ophth.*, Oct., 1882.

7. HIRSCHBERG. 1. Retinal affection in syphilitic persons. 2. Atheromatous degeneration of the retinal arteries. 3. Retinitis centralis punctata et striata. *C. f. A.*, vol. vi, p. 327.

8. LEBER. On the cause of detachment of the retina. *Sitzungsber. d' ophth. Ges. zu Heidelberg*, vol. xiv, 1882, p. 18.

9. MARTIN. Du décollement de la rétine. *Journ. de méd.*, Mar. 11, 1882.

10. NIEDEN. Case of fracture of the base of the skull, amaurosis of the left eye ; temporal hemianopsia ; paralysis of the right external rectus muscle ; diabetes insipidus. Diagnosis : partial rupture of the chiasm. Two cases. *Arch. f. Augenheilk.*, vol. xii, No. 3. Next number of these ARCHIVES.

11. NORRIS, W. F. Embolism of the superior temporal branch of the central retinal artery of the left eye. *Amer. Journ. of Med. Sci.*, Oct., 1882.

12. PARINAUD. Thrombose de l' artère centrale de la rétine suivie de ramolissement cérébral. *Gaz. méd.*, No. 50, 1882.

13. RAMPOLDI. Amaurosi unilaterale (isterica ?) senza reperto oftalmoscopico visibile. Guarigione dopo tre mesi di cura. *Ann. di ottalm.*, vol. xi, 4.

14. REICH. Pregnancy, papillitis, with loss of vision ; rapid recovery. *Medic. Wjestnik.*, 1882, Nos. 39 and 40.

15. RENANT. Sur la rétine du type juxta-épendymaire. *Rev. génér. d' ophth.*, June, 1882.

16. SCHWEIGGER. Observations on detachment of the retina. *Arch. f. Augenheilk.*, vol. xii, p. 52. These ARCHIVES, vol. xi, p. 451.

17. SNELL. Amaurosis fugax. *Ophth. Rev.*, Dec., 1882, p. 400.

18. STORY. Glioma of the retina. *Brit. Med. Jour.*, Dec. 23, 1882, p. 1256. Demonstration of three cases.

19. VOSSIUS. A case of bilateral central scotoma, and the anatomical and pathological condition. Contribution to the knowledge of the course of the nerve-fibres to the macula in the optic nerve, chiasm, and optic tract. *v. Graefe's Arch. f. Ophth.*, vol. xxviii, 3, p. 201.

HIRSCHBERG (4) reports three cases of retinal affections : 1. In a syphilitic person of thirty-nine, who had been infected two years ago, V was reduced to $\frac{20}{40}$, while there was a hazy opacity in the vitreous, and a slight hemorrhage near a small retinal artery. This was absorbed, but a perivascular degeneration of the connective tissue, with numerous small offshoots, remained in the retina. 2. In a debilitated man of fifty-one, in whom sclerosis of the large blood-vessels was plainly marked, there were also atheromatous degeneration of the retinal arteries, and partial atrophy of the optic nerve. The papilla was covered with a new-formation of connective tissue spread out like a fan. Most of the arteries had whitish envelopes. Upon and at the left papilla were glittering points in the sheath. In the right eye there was marked concentric limitation of the field of vision, in the left a central scotoma, while the boundaries of the field of vision were almost normal ; death

from apoplexy. 3. In connection with the case published by Mooren, of retinitis punctata albescens, the author thinks that the disease should be subdivided into four or five groups, and adds the history of three cases : 1. A woman of fifty-nine, suffering from atheromatous degeneration of the blood-vessels, palpitation of the heart, chemical changes in the urine, etc.; there were whitish punctate deposits between the macula and papilla, arranged like a star, which finally disappeared without a trace. Vision was restored to its normal degree, and remained so until death from dropsy ensued. 2. A woman of fifty-eight, who suffered from a gastric affection, and whose urine contained a large portion of uric acid ; there were an extensive extravasation of blood between the macula and papilla, and a delicate whitish spot in the fovea. This spot, in the course of months, changed into a a semi-stellate figure, which lay behind the retinal blood-vessels. At the same time there were a central scotoma and micropsia. The latter symptom disappeared, as did also the white infiltration. 3. In a woman of sixty-two, whose urine was normal, there were bright white spots in the centre of the retina, which gradually disappeared.

Based on his experiments on the introduction of foreign bodies into the vitreous, LEBER (8) believes that a rupture frequently precedes detachment of the retina. The edges of the wound are always drawn inward, indicating that the rupture was produced by a strain from within the eye. The irritation of the vitreous, caused by the foreign bodies, leads to the formation of cicatricial tissue ; the strain thus produced tears the retina, the vitreous penetrates behind it, and the detachment is complete. In fourteen out of twenty-seven cases which were examined, the point of perforation could be found, so that the above theory holds good very often.

SCHWEIGGER (16) attaches less weight to the shrinkage of the vitreous ; there must always be a disturbance in its nutrition. Sudden large detachments probably develop out of small peripheric ones. He advises an early puncture where there is no rupture, and salicylate of soda to produce thorough perspiration.

NORRIS (11) observed in a young man of twenty-nine suffering from affections of the mitral and semilunar valves, sudden amblyopia, involving the whole field of vision except upward and to the left. The ophthalmoscope revealed a yellowish-white embolus at the bifurcation of the upper temporal branch of the retinal artery.

The upper portion of the bifurcation formed a white stripe a short distance above the papilla, above and beyond it contained some blood; the temporal portion was a white stripe, four papilla-diametres long, beyond it there was a whitish reflex along the blood-vessel. The retina corresponding to this region, was opaque, especially in the horizontal meridian. The macula lutea was red as usual. Absorption and return of vision gradually took place.

PARINAUD (12) found, in a woman of seventy-one with atheromatous degeneration of the arteries and heart-disease, thrombosis of the central retinal artery of the left eye. At first there was only a temporary obscuration of the visual field without any cerebral symptoms. Soon after a large central scotoma was observed, peripheric limitation of the field of vision, and color-blindness, while the ophthalmoscope revealed no changes. Three days later, amaurosis with the usual ophthalmoscopic appearance. Later cerebral symptoms, which Parinaud attributes to the same changes in the blood-vessels of the brain. Parinaud compares the œdema, the dilatation of the capillaries, and the hemorrhages in the retina with the red, the subsequent atrophy with the white, softening of the brain. V. MITTELSTÄDT.

DEUTSCHMANN (4) reports the clinical history of four cases of functional anomaly, the affection being "blinding of the retina" produced during the observation of the solar eclipse of July, 1879. The ophthalmoscope revealed the same condition in all: a small white spot in the region of the fovea with a sharp, blood-red edge, the normal ring of reflection around the macula only faintly indicated; positive central scotoma. Vision was never perfectly restored. Material changes had therefore taken place in the retina. Similar conditions were produced in animals, the heat-rays being of course excluded. The result here was a momentary coagulation of the albumen in the retina; the tissue affected was not restored, cicatricial tissue takes its place, and finally we obtain the picture of disseminate choroiditis. The author is therefore inclined to believe that the latter disease may sometimes be due to a similar cause, especially in fire-workers. (The REV. cannot verify this supposition from his own statistics, as the percentage of choroiditis disseminata is much larger in miners than in the employés of the iron and Bessemer steel furnaces.)

FONTAN (6) believes that hemeralopia must be considered a disease of itself; it is connected with general anæmia and

especially malaria. The subjective symptoms are amblyopia, paresis of accommodation, dyschromatopsia, and sometimes peripheric limitation of the field of vision; the objective symptoms are dilatation and sluggishness of the pupil, stagnation in the retinal veins, ischæmia of the retinal arteries, and circumscript serous transudation in the retina. The prognosis is generally good, though the end in some cases is dubious. It is best treated with eserine. MARCKWORT.

FANO (5) doubts the diagnostic value of the central color-scotoma in amblyopia *e potu*, but lays stress upon the relation between vision and the scotomas. The author reports a case in which the scotomas were more marked in the better eye, while in the poorer they were less so. MARCKWORT.

NIEDEN (10) reports two cases of amaurosis of one eye and temporal hemianopsia of the other eye from fracture of the base of the skull; loss of hearing in one ear, and paresis of the external rectus of the better eye. Probably its chiasm was ruptured. Atrophy in the amaurotic eye, slight improvement in the preserved portion of the visual field. Hearing was not restored.

RAMPOLDI (13) reports a case of hysterical amaurosis in a girl of eighteen suffering from conjunctival catarrh, severe photophobia, and lachrymal secretion. She had an attack of megrim lasting for hours, and next day became entirely blind in the left eye, while in the eye itself no change was perceptible except the immovable pupil. Her general health improved after an antiphlogistic treatment of two months; the megrim ceased, but the eye remained blind. In the third month, after giving chloral and large doses of quinine, vision gradually returned and finally reached $\frac{20}{30}$. From beginning to end the ophthalmoscope had revealed no change. DANTONE.

SNELL (17) observed a case of amaurosis fugax in a girl of nine years who, after feeling unwell for a day or two, became suddenly giddy and lost all perception of light. The pupils were dilated and fixed, and no abnormity could be discovered with the ophthalmoscope. After two days, perception of light returned and subsequently vision improved by degrees till in six weeks V= $\frac{20}{30}$ and J 1. FERGUSON.

VOSSIUS (19) reports another case, the third on record, of central amblyopia, in which an autopsy was made (Samelsohn and Nettleship). The case was one of a man with right-sided hemi-

plegia, without any cerebral symptoms except a slight impairment of speech ; fundus normal ; central scotoma. The autopsy showed an abscess *2 cm.* long and broad, with the pia mater adherent in the anterior central convolution. The upper third of the latter was completely softened, but the posterior central convolution was healthy. Under the abscess there was a cyst. Otherwise the brain was normal. Externally the optic nerve, chiasm, etc., also appeared normal. The microscopic examination, however, revealed the same atrophic degeneration as in Samelsohn's case (*cfr.* Rep. *Arch. f. Augenheilk.*, vol. xii, p. 247), the same course, the same changing form of the atrophic fascicle, and the same distribution in the retina, so that also the conclusions in regard to the nerve-fibres supplying the macula lutea must be the same. In this case, however, the atrophic fibres could be traced nearer to their origin than in the other.

VII.—OPTIC NERVE.

1. BULLER, F. Remarks on neuritis. *Can. Med. and Surg. Journ.*, June, 1882.

2. EWETSKY. Case of endothelioma of the outer sheath of the optic nerve. *Arch. f. Augenheilk.*, vol. xii, p. 16.

3. HUC. Des tumeurs du nerf optique. *Thèse de Paris*, May 16, 1882.

4. MANZ. On endothelial degeneration of the optic nerve. *v. Gräfe's Arch. f. Ophth.*, vol. xxviii, 3, p. 93 ; and *Sitzungsber. d' ophth. Ges. zu Heidelberg*, 1882, p. 162.

5. NIEDEN. Contusio med. spinalis et cerebri. Unimportant initial symptoms, then progressive spinal affection (ataxy), exophthalmus of both eyes, atrophy of optic nerve, gradual improvement of general health. *Arch. f. Augenheilk.*, vol. xii, p. 45.

6. RAMPOLDI. Della stricnina nella cura dell ' atrofia dei nervi ottici. *Ann. di ottalm.*, vol. xi, 5.

7. REICH. Loss of vision from papillitis in a pregnant woman ; rapid recovery under treatment. *Klin. Monatsbl. f. Augenheilk.*, vol. xx, p. 349 ; and *Medicinsky Wjestnik.*, 1882, Nos. 39 and 40.

8. VOSSIUS. Myxosarcoma of the optic nerve. Contribution to the knowledge of the genuine tumors of the optic nerve, *i. e.* those developing within the outer sheath. *v. Gräfe's Arch. f. Ophth.*, vol. xxviii, 3, p. 33.

BULLER (1) thinks that none of the present theories sufficiently explains papillitis in cerebral affections. He reports cases of neuritis connected with dysmenorrhœa. He considers Hughlings-Jackson's mode of treatment the best—mercury and iodide of potassium. BURNETT.

NIEDEN (5) reports a case of concussion of the spinal column produced in a young man of eighteen by a fall to a great depth. Nine months later, headache, giddiness, ataxic symptoms, exophthalmus, diminution of sight, and atrophy of the optic nerve developed. The right side especially was affected. He gradually improved, the exophthalmus subsided, ataxy diminished, but the atrophy of the optic nerve increased, and in the right eye posterior polar cataract developed. The cause of the atrophy may be referred with certainty to the influence of the spinal cord on the vaso-motor system of the eye.

REICH (7) observed loss of vision in a girl of sixteen of extravagant habits, who was in the seventh month of pregnancy, and had suffered from hysterico-epileptic attacks; the papillæ appeared hyperæmic and swollen. There was also marked photophobia of one eye. Energetic derivative treatment restored sight in a few days, while the choked disc disappeared; later, complete recovery. The case may be set down as one of neuritis, as it is observed by reflex action in suppression of the menses and deviation of the uterus.

EWETSKY (2) found, in a boy of fourteen, left-sided exophthalmus, which had been increasing for eight years, produced by a tumor of the outer sheath of the optic nerve; it had completely spared the inner sheath and the optic nerve by which it was penetrated, and proved to be an alveolar sarcoma or rather an endothelioma, with deposits of genuine bone in its interior. Only three similar cases are on record (Billroth, Neumann, Knapp). There was a relapse three months later.

MANZ (4) reports the case of a man of sixty suffering from atrophy of the papillæ, amaurosis, and psychical disturbances of a high degree. The post-mortem showed diffuse chronic basilar meningitis. The optic nerves were increased at the optic foramen to a thickness of 7 *mm.* by clusters of endothelial proliferations springing from the pial sheath of the optic nerve. From the optic foramen the thickness decreased in both directions. The nerve fibres and septa of connective tissue were completely pushed

aside. The medulla disappears first. There were no round cells. There was also thrombosis of the central retinal vein, though this might be of more recent origin. The impulse to the endothelial proliferation was probably given by a transudation coming from the cranial cavity along the sheath of the optic nerve.

Vossius (8) remarks in a general discussion of the twenty-seven cases of tumors of the optic nerve thus far reported, that 14 of them, = 51.85 %, were sarcomas; 6, = 22.2 %, myxomas; 5, = 14.8 %, fibromas; 1, a scirrhous carcinoma; and 1, a genuine neuroma (Perls). They occur principally in childhood up to the age of eighteen, so that they do not originate during the fœtal period. Vossius adds seven more reported cases, and two of his own. 1. A boy two and a half years old suffered from amaurosis of the left eye and papillitis. It was found to be due to a tumor of the optic nerve, which proved to be a myxosarcoma composed in part of long fibrous cells. Three years later there had been no relapse. 2. In a boy eight years old there were amaurosis and white atrophy of the optic nerve, due to tumor of the latter, a very vascular myxosarcoma, which had developed in the posterior portion of the optic nerve within the outer sheath. It consisted of spindle-cells with long and spiral offshoots. No relapse nine months later. Perls' case is also probably a pure myxosarcoma, the occurrence of neuromas being very doubtful.

Rampoldi (6) has lately obtained good results in atrophy of the optic nerve by using strychnine. He injects it subcutaneously and gives it internally in form of the infus. Fab. S. Ignazii. He injects 0.001 of strychn. nitr. once or twice a day, and sometimes gives as many as 60–70 injections. Of the five cases reported in detail three were genuine white atrophy, and the other two were the result of optic neuritis. The results of the treatment in the latter two cases were excellent in regard to vision; in one of the patients chronic strychnine-poisoning ensued, which lasted many months. In the three cases of white atrophy the results were not so brilliant, though there was decided improvement. In one of the latter cases there was also marked hemeralopia; this disappeared entirely under the treatment. The author thinks that in two of the patients the disc regained a slight reddish tint. Unfortunately no determinations of the field of vision were made. Dantone.

VIII.—INJURIES (FOREIGN BODIES).

1. BENSON. Sudden amaurosis of left eye resulting from gunshot injury to the right. *Brit. Med. Journ.*, Dec. 2, 1882, p. 1085.

2. BENSON. Injury to the optic nerve without injury to the globe. *Brit. Med. Journ.*, Dec. 2, 1882, p. 1085.

3. PESCHEL. Communicazione sopro un caso di cisticerco sottoretinale. *Giorn. d. R. Acad. di med. di Torino.* No. 10–11, 1882.

4. SNELL. Blow on eye. Injury to optic nerve. *Ophth. Rev.*, Dec., 1882, p. 402.

BENSON (1) relates the following curious case. A young girl was sitting in a kitchen, and a few yards away from her right hand a man was cleaning a gun. The latter went off and some of the shot entered her O D. She retained sight in O S sufficiently long to see him lay the gun on the table, and then it vanished completely and did not return. When B. saw her some weeks later O D was completely collapsed. O S externally quite normal. Lens clear and tension normal. Optic nerve completely atrophic. Grain of shot probably passed through O D pierced bony septum, and wounded optic nerve, its sheath, or large blood-vessels. FITZGERALD.

BENSON (2) reports the case of a boy who while playing with another boy received a thrust in the face from an old broken foil. O D at once became blind. Lids swelled. There was slight external hemorrhage, and he suffered considerable pain. Ophthalmoscope showed no change in fundus. Pupil half-dilated. V = O. Very slight papillitis resulted in a few days, and total atrophy finally occurred. V subsequently improved to seeing fingers badly at four inches at portion of field of vision. Movements of globe normal. B. believes that the blunt point of the foil penetrated deeply beneath the globe and nipped the nerve probably just at its entrance through the optic foramen. FITZGERALD.

In SNELL'S (4) case there were considerable ecchymosis and absolute loss of vision. No ophthalmoscopic change, but the disc subsequently atrophied. Treatment was of no avail.

FERGUSON.

PESCHEL (3) describes a case of cysticercus observed in a cook. The operation performed by Reymond was in so far not successful

(in correction of the report in the last number of these ARCH.), as about half a teaspoonful of yellowish liquid was discharged, but not the worm itself when the sac was opened from the sclerotic. The worm was probably dead and adherent; nor could Reymond see the movements, before the operation, which Peschel had noticed. This cysticercus is not the second, as stated erroneously before, but the fourth observed in Italy (one in Catania, three in Turin). DANTONE.

IX.—OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

1. ARMAIGNAC. De la cecité des mots. Communication a la réunion des soc. sav. de la Sorbonne, April 13, 1882. *Rev. d' ocul. du sud-ouest*, p. 73, 1882.

2. BRADBURY. Absence of eye-symptoms in cerebellar tumor. *Brit. Med. Jour.*, No. 4, 1882, p. 895.

3. CORNWELL, H. G. Purulent cyclitis from septic embolism of the eye in a case of phlegmonous erysipelas. *N. Y. Med. Rec.*, Aug. 12, 1882.

4. COOMES, M. F. Menstrual amblyopia. *Amer. Med. Herald*, Oct., 1882.

5. DENISSENKO, G. S. The changes in the eye in Bright's disease. *Med. Wjestnik.*, 1882, No. 49–50, and 1883, Nos. 2, 3, 6 etc; not yet completed.

6. DICKINSON. Double optic neuritis and loss of vision in meningitis. *Brit. Med. Journ.*, Oct. 14, 1882, p. 725.

7. FÉRÉ. Contribution a l' étude des troubles fonctionels de la vision par lésions cérébrales (Amblyopie croisée et hémianopsie). *Thèse de Paris*, 1882, No. 107.

8. FÉRÉ. De l' hystérie chez les jeunes garçons. *Le progr. méd.*, Nos. 50, 51, 1882, and Nos. 1 and 5, 1883.

9. GILLES DE LA TOURETTE. Rotation et déviation conjuguées de la tête et des yeux du coté droit, hémiplégie et hémian anesthésie droite; contracture du bras gauche sans anesthésie; absence de lésions cérébrales, cérébelleuses, et médullaires, petit faisceau de sclérose bulbaire d' ancienne date. Société anatomique, 1882. The case is not clear.

10. HOLMES. Case of puerperal retinitis producing blindness and loss of color-perception. Recovery. These ARCH., vol. x, p. 421; *Arch. f. Augenheilk*, vol xii, p. 89.

11. McKay, R. J. Ocular affections from suppression of the menses. *Amer. Journ. of Med. Sci.*, Oct., 1882.

12. Krassowsky. Observations on malarial fever. *Wratscheb-Wjedomoski*, No. 39.

13. Leber. On cataract and other ocular affections produced by a stroke of lightning. *v. Graefe's Arch. f. Ophth.*, vol. xxviii, 3, p. 225.

14. Nettleship. Value of eye-symptoms in the localization of cerebral disease. *Brit. Med. Journ.*, Dec. 2, 1882. pp. 1081–1084.

15. Nieden, A. Report of cases of ocular affections from injuries to the brain and spinal cord. *Arch. f. Augenheilk.*, vol. xii, pp. 30–52. Next number.

16. Orsolini. Contriburtioni alla casistica circa l' emeralopia dipendente dalle affezioni epatiche. *Imparziale Ann.*, vol. xxii.

17. Rampoldi. Sulle cause meno frequenti dell' astenopia. *Ann. di ottalm.*, vol. xi, 4.

18. Rampoldi. Rapporti morbosi esistenti fra gli organi della respirazione e l' organo della vista. *Ann. univ. di med.*, No. 261, 1882.

19. Rosander, Prof. and Berg, A. Fall of hyerntumör med konsekutiva symptom från ögonen. *Hygea*, No. 12 ; *Svenska Läk. Selskap Förhandl.*, pp. 258 and 251, Stockholm.

20. Santos Fernandez. On blindness in yellow fever. These Arch., vol. x, p. 440 ; *Arch. f. Augenheilk.*, vol. xii, p. 92.

21. Smith, S. Eye-symptoms in locomtor ataxy. *Brit. Med. Journ.*, Nov. 4, 1882, p. 876.

22. Snell. Atrophy of optic disc after hemorrhage. *Ophth. Rev.*, Dec. 3, p. 403.

23. Snell. Atrophy of optic disc after enteric fever. *Ophth. Rev.*, Dec., 1882, p. 403.

24. Suckling, C. W. Lateral spinal sclerosis with optic neuritis. *Brit. Med. Journ.*, Dec. 9, 1882, p. 1152.

25. Thomson (J. R. Wolfe's clinique). Syphilitic inflammation of the eye. *Med. Times and Gaz.*, Dec. 14, 1882, p. 720.

26. Urbantschitsch. The influence of affections of the external and middle ears on the senses, especially sight. *Wiener med. Blätter*, No. 42, p. 1295 ; *Sitzungsber. d. Kais. Ges. d. Aerzte in Wien.*

RAMPOLDI (17) discusses the accommodative asthenopia, often only temporary, which is occasionally observed in general affections of the body, and which should interest the general practitioner as well as the oculist. According to Rampoldi, the affections which sometimes affect the power of accommodation are especially a general state of weakness after severe sickness, particularly typhoid fever and diphtheria, hemorrhage, etc. The power of accommodation is sometimes diminished by reflex action transmitted through the fifth nerve (conjunctivitis, carious teeth, etc.) or from the spinal cord and sympathetic nerves (commencing tabes, hysteria, uterine diseases, and gastric affections); even the normal course of digestion sometimes reduces the breadth of accommodation for a few hours; the asthenopia of drunkards and smokers must be ascribed to the stomach. Frequent mental excitement also affects the power of accommodation. DANTONE.

NETTLESHIP (14) discusses the question of the value of eye-symptoms in the localization of cerebral disease. He considers that "the whole subject naturally falls into two divisions, according as disturbances of vision and sensation or affections of ocular movement cause the symptoms we have to examine." As a point of importance in the differential diagnosis of cases of single optic neuritis depending on brain disease and those in which the disease is not situated farther back than the optic foramen, N. is of opinion that in the latter the signs of the œdema and venous stasis are usually more marked. In speaking of cases of blindness without visible changes, in infants, N. says he formerly thought that the prognosis was necessarily fatal as regards sight, but more lately he has seen recovery of sight, apparently perfect, take place in several cases. Some of these cases showed signs of slight hydrocephalus, but others, as far as he could judge, were quite free from all signs or symptoms of cerebral disease. In concluding, he alludes to a subject upon which, as he says, observation is needed, namely, uniocular diplopia from cerebral disease. Several cases have been reported, and yet the symptom is so unintelligible that a very natural scepticism prevails regarding it. FITZGERALD.

NIEDEN (15) reports a case of cerebral lesion (*cfr. antea*), in which a knife penetrated the left temporal bone, producing right-sided hemiplegia without any sensory disturbance, paralysis of the left abducens, and sensory aphasia. These symptoms are explained by assuming that the knife, penetrating obliquely

into the temporal bone, had injured the motor centre of the extremities near the central convolution, and the centre of memory for words, and probably, also,the origin of the abducens of the left side.

SMITH (21) recounts the history of two interesting cases of locomotor ataxy—referring specially to the syphilitic origin of the disease and its treatment by iodide of potassium. In one case the first symptoms noticed were dimness of vision, drooping of left eyelid, dilatation of right pupil, and external strabismus. The patient became completely blind a year and a half before his death. In the other case, the sight at the patient's first admission into the hospital was good, but the Argyle-Robertson-pupil symptom was well marked. On readmission a considerable improvement took place in general symptoms with the use of iodide of potassium. The sight was never dim. FITZGERALD.

SUCKLING (24) reports a case of this disease, the signs of which were more marked on the right side. The patient's eyes were examined by Mr. Priestley Smith, who found evidence of optic neuritis in the right one.

DICKINSON (6) reports a case of double optic neuritis and loss of vision in meningitis. No strabismus or ptosis. Pupils large and sluggish ; symptoms of papillitis more marked in the right eye than in the left. About six weeks later the neuritis was still marked in left eye, but four weeks afterward signs of atrophy began to appear. For a period of over three months she remained in a semi-comatose condition with the head greatly detracted, with considerable rigidity of the muscles, and passing her evacuations without any movement or notice on her part. About two months later she had so far recovered as to be able to speak quite rationally and to use her hands. The pupils were widely dilated, but she could not see at all. Some weeks later the discs are reported as pale, but not excessively so ; the margins not very sharply cut ; the arteries were small, and the veins tortuous. The following month vision began to return. The last note, made about sixteen months after the commencement of the attack, states that the pupils were of medium size, smaller than they used to be, but equal ; the optic discs whiter than usual, with well-defined edges, the veins not large, but tortuous. The sight, so far as could be tested, was quite good in relation to acuity, field of vision, and perception of colors. FITZGERALD.

URBANTSCHITSCH (26) explains the influence of affections of the external and middle ears on sight, by reflex action, and even believes that he can confirm this by photometric measurements. The reflex action is transmitted through the fifth nerve.

COOMES (4) reports four cases of menstrual amblyopia. The main symptoms were amblyopia, varying from a very slight loss of visual power to almost total blindness, photophobia, burning and stinging sensations in the lids, and sometimes deep-seated pain in the eye and slight conjunctival injections. These symptoms disappeared when menstruation returned. BURNETT.

HOLMES (10) saw a case of total blindness with albuminuria, in the sixth month of pregnancy, due to marked exudative retinitis and detachment of the retina. After delivery, vision slowly returned, but color-blindness remained for three months, when first blue, then yellow, then brownish-red, and finally green, were again recognized.

MCKAY (11) describes twelve cases of ocular affections from suppression of the menses. In almost all of them the symptoms manifested themselves at the beginning of the menses or soon afterward. Choked disc was frequently observed, sometimes double vision, and very often asthenopia. V was diminished in some cases. When these symptoms are observed in eyes apparently normal in external appearance, especially in girls, the regularity of the menses should always be inquired into. BURNETT.

In speaking of the treatment of hysteria in young men, FÉRÉ (8) discusses, besides other affections of the senses, also those of the eye. In hemianæsthesia there is also amblyopia of the eye of the same side, which seldom ends in amaurosis. At the same time the field of vision is impaired in both eyes when the anæsthesia is general or unilateral, but combined with analgesia of the other side. The perception of space and light is also reduced, but most of all, color-perception; sometimes it is only slightly affected, while sometimes there is complete color-blindness. Yellow and blue are recognized longest, though there are exceptions where red is the only color recognized or its field of vision is the most extensive, as shown by an observation of Parinaud and several of his own. No ophthalmoscopic changes. v. MITTELSTÄDT.

CORNWELL (3) reports a case of purulent cyclitis after phlegmonous erysipelas. Only the right eye was affected under the usual symptoms of purulent cyclitis. The author has collected 48

cases of septic embolism of the eye, 39 of whom died. The author's case was not accompanied by severe inflammatory symptoms like chemosis, swelling of the lids, exudation into the pupillary space, etc., which he thinks is the reason why the embolism developed in the ciliary body and suppuration afterward set in in the choroid. BURNETT.

KRASSOWSKY (12) observed the following ocular affections in malarial fever: 1. Intermittent ophthalmia. In a patient twenty-three years old hyperæmia of the conjunctiva, œdema of the lids, photophobia, pain in the depths of the orbit, pupils contracted. Spleen enlarged. On the following day all these symptoms had vanished. On the third day a similar attack. On the fourth he was well again. On the fifth a regular paroxysm of fever. Cured with quinine. 2. Malarial hemeralopia. The author observed in the fever district three cases of hemeralopia which yielded to quinine. HIRSCHMANN.

SANTOS FERNANDEZ (20) discusses three cases of blindness from yellow fever, a severe complication of this disease which heretofore has been scarcely noticed. One patient recovered and his vision was completely restored; the other two died. The ophthalmoscope revealed nothing abnormal in the fundus.

SNELL (23) reports a case of atrophy after enteric fever, in which vision suddenly failed in the left eye; disc atrophied; V. perception of light; right reads J 1. Embolism was probably the cause. FERGUSON.

ORSOLINI (16) investigated the alleged frequency of hemeralopia in affections of the liver. Among four severe cases he found it only once in a case of atrophic cirrhosis, in which it continued and constantly increased until the patient died. No report of the appearance of the fundus or the vision of the patient.

DANTONE.

RAMPOLDI (18) has observed a few cases of neuroparalytic keratitis in convalescents, from adynamic pneumonia due to malaria. Once, in a case of empyema, he observed metastatic panophthalmitis. DANTONE.

THOMSON (25) reports four cases of syphilitic inflammations of the eye, one of choroiditis, one of retinitis, one of papillitis, and one of episcleritis, all of which did well under antisyphilitic treatment. FERGUSON.

MISCELLANEOUS NOTES.

A. Lüer, known to oculists as one of the best instrument makers, died at Paris Feb. 20, 1883, eighty-one years old. He was a native of Brunswick, Germany.

The eighth meeting of the International Medical Congress will take place at Copenhagen, Aug. 10 to 16, 1884.

The French Ophthalmological Society met for the first time Jan. 29 to 31, 1883, at Paris.

The fifteenth meeting of the German Ophthalmological Society will take place at Heidelberg, Sept. 9 to 12, 1883.

The nineteenth annual meeting of the American Ophthalmological Society will be held, July 18th and 19th, at the Kaaterskill House, Catskill Mountains, New York.

ERRATUM.—The third *International Otological Congress* will be held in Sept., 1884, not 1883, as erroneously stated in the *Archives of Otology*, vol. xi, p. 184.

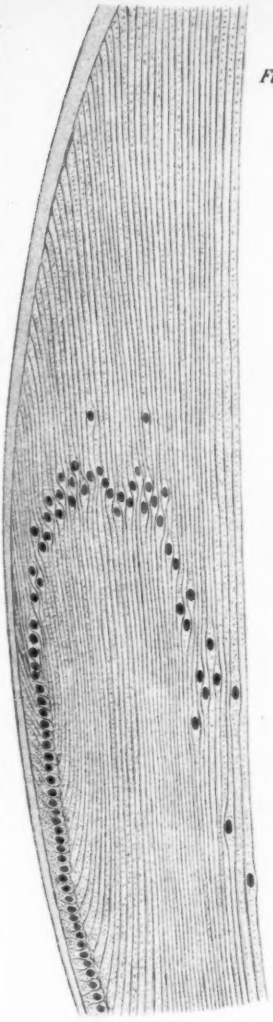


Fig. 4.

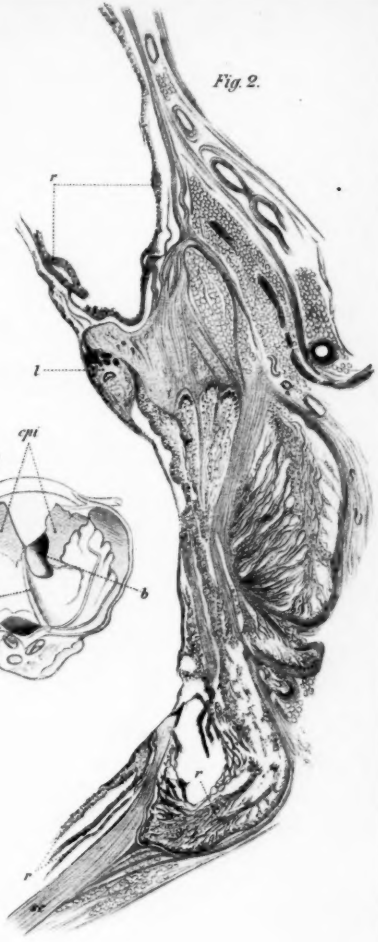


Fig. 2.

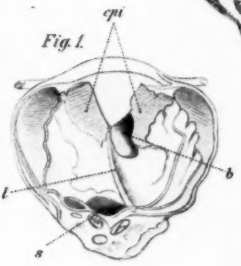


Fig. 1.

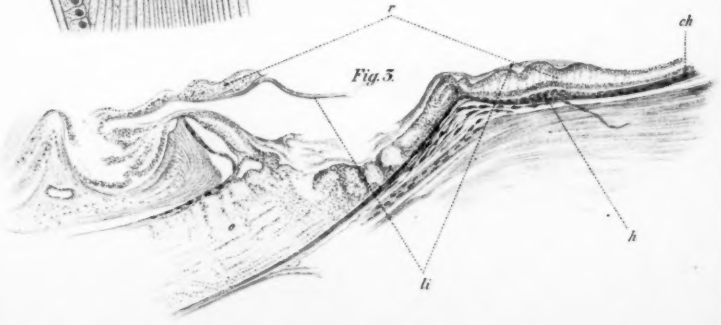


Fig. 3.

Lith. Anst. Werner & Winter Frankfurt a/M.